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ABSTRACT

Consisting of a selection of papers presented at the 1982 and 1983 meetings of the North Central Reading Association, this yearbook includes sections on computers, research, professional issues, and programs. Papers include: "The Computerized Broom Will Sweep Our Future Classrooms: But Not Necessarily Clean" (George E. Mason); "Beyond the Computer: Reading as a Process of Intellectual Development" (Mark E. Thompson); "The Technical Revolution and Innovative Reading/Learning Techniques" (Mary Schwalen); "The Teaching of Reading in Technotronic Times: Values and Goals Clarification" (Sherry Hill Howie); "The Computer: No Utopia" (Marie F. Cowart and Harry J. Cowart); "The Computer Format versus the Programmed Format" (Jan Dursky); "A Comparison of Two Methods of Instructing Premedical Students in Study Skills" (Sister Patricia Remington); "The Basic 'How To's' for Validating a Study Skills Inventory" (Virginia G. Blasingame); "Tests and Books Used in College Academic Skills Programs" (Carmen J. Carsello and James W. Creaser); "Current Issues in the Assessment of Reading Comprehension" (Earl F. Rankin); "Scientific versus Humanistic Approaches to Reading" (Mark E. Thompson); "A Topical Concordance of Selected Study Skills Texts" (Joseph A. Fisher); and "The Palab's Painless Spelling Program" (Donald Goodman). (RS)

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North Central Reading Association

1984 Yearbook

College and Adult Reading
Volume XII

Edited by

Joseph A. Fisher

DRAKE UNIVERSITY

1984

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PREFACE

The Twelfth Yearbook of the North Central Reading Association contains a selection of papers presented at the 1982 meeting in South Bend, Indiana held at the University of Notre Dame and from the 1983 meeting in Minneapolis held at the Hyatt Regency Hotel.

The individuals responsible for developing and arranging these two programs were Boyd Jackson and Michael Bennett respectively. The Board and membership wish to extend a sincere thank you to both of them for stimulating and interesting programs.

It has been noted with considerable satisfaction that the cordial and informal quality which has characterized our meetings through the years has again been well preserved in these last two meetings. The success of any conference is as much a function of the quality of participation of those in attendance as the material presented. We are especially blessed with excellent participation at our meetings and many fine presentations. Our hope is that both will continue to be hallmarks of our yearly meetings. A special thanks is extended to those whose attendance has helped make these meetings a success and to those generous souls who have taken on themselves the arduous task of preparing such interesting and useful presentations.

The editor wishes to thank Mrs. Suzanne Howard for her careful preparation of this manuscript and the Office of Student Development Services at Drake

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Joseph A. Fisher
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Twelfth NCRA Yearbook

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THE COMPUTERIZED BROOM WILL SWEEP OUR FUTURE CLASSROOMS: BUT NOT NECESSARILY CLEAN

GEORGE E. MASON, Ph.D.
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ABSTRACT

Dr. Mason evaluates the relative strengths and weaknesses of books and computers on ten characteristics and concludes that at present books have a six to four edge on computers. The specific impact of computers on books depends on the use of printed text. When they are designed to provide discrete bits of information (telephone books and encyclopedias) the computer is at a definite advantage and is already beginning to replace books. Only time will tell whether the textbook will be superseded by computers.

In primaries, my dad used to always vote for the democratic candidate who was least experienced politically. He claimed that it took time for a politician to learn how to accept bribes and negotiate graft. His rule of thumb was "A NEW BROOM SWEEPS CLEAN." Well, the computer is sweeping into educational practice throughout our country. Some school districts have computers in every room. Others have a lab into which classes are scheduled so that every pupil spends some time on-line each week. Still others have one or two computers in the library or on a cart that circulates from room to room. Yet the broom is not sweeping anything out. Each classroom continues to have a teacher. Each room also contains several kinds of books--

textbooks, workbooks, trade books, reference books, gradebooks, notebooks, copybooks, diaries, account books, etc. But what will happen if schools continually do what many did in the fall of '82? What if they spend their book budget on computers? Let me address this contingency.

First, it would seem that less money will be spent on books. Now that's frightening to a reading teacher. I don't like the prospect that less may be spent on books, regardless of the reasons given. But, since books and computers are competing for the same purchasing funds, and since both display text and pictures on a two dimensional surface, let's compare the two on ten points: (1) Page size, (2) Print features, (3) Portability, (4) Access, (5) Cost, (6) Visual comfort and health, (7) Interactive potential, (8) Motivation, (9) Recording and reporting, (10) Accessories required.

PAGE SIZE:

If one inspects carefully the screens most-used with school computers, several drawbacks are evident. One of those is that the curvature of the screen often blurs picture parts or letters displayed near the edge. For this reason, computers-in-education experts recommend that margins be wide and that a very limited amount of print be displayed on the screen at any one time. John Edwards, former director of the computer lab at Georgia's Instructional Resource Center, limits his print displays to 34 characters across and to sixteen lines. This translates to about 80 words per screen, only about 20% of the print displayed on a typical book page. This limitation is not a serious one, but it does mean that the computer reader may be "turning pages" (by pressing the RETURN or ENTER keys or the space bar) five times as often as the book reader. Whether these disruptions interfere with comprehension of longer text may well be the subject of future research.

PRINT FEATURES:

Early researchers in reading long ago established the fact that adult readers direct their eyes to the upper edges of the printed words they read. Apparently their configuration clues are taken from this upper edge. Early researchers also found that sophisticated adult readers were slowed more than ten percent when given text is printed all in capital letters. Unfortunately, the computers now common in schools and middle class homes often can produce only upper case letters. This may be only a minor inconvenience to adult readers, because recent research (Henney, 1983) suggests that it matters not to sixth graders.

What does matter, however, is the spacing between lines and the formation of characters on the screen. At a recent conference at the Clearwater Beach (Florida) Holiday Inn, I used a terminal which the hotel had placed in the lobby for the convenience of its customers. By typing //LOGON, I called up a master menu. Then, by pressing the number 3, which preceded ENCYC on the menu, I called up an encyclopedia and was asked to type in a key word. Seconds later I was asked to choose between "1. Reading, Mass.; 2. Reading, PA; 3. History of Reading; and 4. Dyslexia." I chose 3 and instantly was shown the first of twelve pages on the history of our field.

Unfortunately, it was very difficult to read. Not only were there no spaces between lines of print, but also the lower-case letters had no true descenders. Consequently, lower case g,j, p, and q were all raised up so that their descending lines would not overlap the letters in the next line. My configuration clues for reading words with those letters actually interfered with both my speed and my comprehension.

This same sort of problem surfaces when computer printouts are being produced. Some of the less expensive printers do not offer true descenders. From these printers, the lower-case text may be very laborious reading.

Still another problem is apparent when color computers are used. With some of these, whenever colored pictures are presented on the screen, colors also appear in various parts of the letters, often making the print nearly illegible.

Some of the very inexpensive computer chip devices, such as the Speak-and-Spell use L.E.D displays of block letters made of various arrangements of straight lines. While use of these devices may be helpful to beginners, the implications of their text display formats are unknown.

Printers present yet another problem. Most can justify print, spacing it in such a way that the right margin is just as straight as the left. Unfortunately sometimes this results in stretching out words so that the letters in words are

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more widely separated than the words themselves are separated on the lines above and below. When we use computerized printouts as handouts to our classes we need to think about whether to right-justify the text. My belief is that we should not.

PORTABILITY:

Most of today's desktop computers are easily carried from one place to another. However, moving them is seldom as easy as moving a book. On the other hand, carrying a diskette or two from one computer location to another is much easier than carrying a set of books or an encyclopedia. On this score, however, I "give the nod" to the book.

ACCESS:

For most Americans, it's still easier to acquire books to read than it is to acquire computers to use. However, on campus at my university a determined attempt is being made to put computer labs (with sets of both microcomputer and mainframe terminals) within easy access to all students. Although we still muddle along with a centralized library that's more than a mile away, our computer labs are decentralized. Consequently, it is easier for students to get to a computer or terminal than it is for them to get to some books.

While we're on this topic, it should be noted that some high school libraries have subscribed to computer networks so that their pupils can access the tremendous databases that the networks provide. We should also note that an elementary school in Colonial Beach, Virginia allows children to check out computers from its library. Practices such as these indicate that we are in a period of very rapid change and that any generalizations drawn today may be obsolete next month.

COST:

In the year 1980, the cost of storing information on paper became more expensive than storing information electronically. American business has come to recognize this and in 1982 many major corporations made it their goal to "do away with paper." Interoffice communications were to be done with electronic mail and repetitive secretarial tasks were to be handled with word-processing which often would be mailed electronically for reading from the screen.

In 1982, the French telephone company in Rheins offered its clients terminals as replacements for their telephone books. By doing so the company hoped to save thousands of francs which would otherwise have been spent in the printing and distributing of directories and in paying its "information" operators. North American telephone company executives have been keeping tabs on the French experiment. Perhaps we'll all soon have terminals with our home phones.

When it comes to cost, the computer suffers only when first-year initial outlay is considered. American businessmen and French phone executives already are convinced that computers are cheaper than print-on-paper in the long run. Will our boards of education lag far behind in developing such conviction? And what may happen to our textbook industry?

VISUAL COMFORT AND HEALTH:

When computer buffs get together, they knowingly blink or rub their eyes when discussing work on some program that caused them to spend a lot of time looking at a computer display screen. Screen glare is always present.

One kind of glare can be modified or nearly eliminated. This is glare reflected off the CRT's glass screen. Light bulbs, sunlight coming through windows, and even light-colored objects reflect into the eye of the viewer. To reduce this glare, computer owners draw shades over their windows, fix visors over their screens, and hang egg-crate shielding under their flourescent lamps. Some buy tilt turntables so that screens can be tilted or turned to reflect light away from the viewer's line of sight. Others place their faith in elevator stands which enable CRT viewers to raise or lower the CRT to maximize the viewer's eye and body comfort. In recent months computer CRT manufacturers have begun building tilt and elevation controls into their viewing screens. This promises needed relief.

The second kind of glare can be reduced, but not completely eliminated. When excited by the cathode-rays flowing from the back of the CRT, the flourescent front surface glows, sending light rays directly into the eyes of viewers. The resultant discomfort has led the Newspaper Editors' Guild to ask the National Institute of Occupational Safety and Health (NIOSH) to investigate the effect of CRT-viewing on the human body, especially the eyes.

In May of 1981, the NIOSH team reported that there was no radiation hazard, but that there was an eyestrain problem. Nearly three quarters of all the regular CRT-users had vision-related complaints, whereas only 27.4% of the non-CRT-users had them. The CRT-users also had nearly twice as many other physical complaints (Video display terminals blamed for aches, pains, 1982). NIOSH recommended that CRT-watching employees be given fifteen minute breaks every hour. Such a recommendation should be a topic for great concern by those responsible for the scheduling of children's CRT viewing time.

INTERACTIVE POTENTIAL:

Unlike the print in textbooks, computer print can expand in size, blink on and off, scroll up or down on the screen, repeat itself indefinitely, change colors, or appear letter-by-letter (as if someone were typing it on the screen). These options can be built into the program or they can be determined by the teacher who selects from options made available by the program. In fact, the programmer and/or teacher can give these options to the pupil or can cause one option or another to be available, but dependent upon the pupils' responses. Some computer programs address the pupil as though the pupil were a friend and some even offer sympathy for a poor student performance. Consequently, the computer screen wins as the most interactive text display.

MOTIVATION:

The motivational power of the computer seems amazing. Children who refuse to work on workbook pages will compete for the privilege of completing workbook-like pages presented by the computer. Remedial reading teachers who work in computer labs report that good readers often ask permission to join Chapter One classes just to gain access to the lab computers.

We need not hesitate in chalking up another victory for the computer. However, the victory may be a temporary one. In the future, when computers are more easily accessible, their appeal may be decreased dramatically. And, if teachers assign and/or require computer lessons that are too difficult or boring (as they now often assign book lessons), our reluctant book readers will undoubtedly become reluctant computer-readers.

RECORDING AND REPORTING:

Many computer programs keep records of pupil performance. Such programs seem to be most desired in school settings where children leave their classrooms to get extra reading practice at the computer lab "down the hall." However, in classrooms where the computer is right there for pupils to practice on as the teacher watches from the front of the room, the record-keeping parts of computer programs are often not used.

However, whether the computer's record-keeping capabilities are used or not, its potential for doing so is certainly greater than that of a book. No book writes itself unless it's computer-controlled. The computer's greatest value for the teacher may be its memory and its ability to sort and compile records of all kinds. The only unfortunate circumstance is that computerized management programs almost always require extensive teacher input (names, scores, grade level, age, teaching materials available, bases for prescriptions, etc.) before the program becomes helpful. Sometimes teachers are so overwhelmed by the "startup" tasks that programs with great labor-saving potential for the future never get implemented.

ACCESSORIES REQUIRED:

Among the accessories which all computers require are memory-storing devices (usually cassette tape recorders or floppy disk drives), printers, and programs. One other requirement must also be mentioned--a constant non-fluctuating source of electricity. While it is true that most of us need electricity for reading books at night, the computer-user needs electricity all the time he reads.

The computer is an assemblage of switches, circuits, keys, and cases. Without programs it performs little service to mankind. The programs are what causes the CRT to display the pictures and print which we observe. Programs also govern the computer as it controls the printing of text on paper.

Unfortunately, programs are stored on magnetic disks and tapes which can be erased by the X-ray machine at the airport or post office. Unlike books, which can be carried casually in a pocket or shipped by parcel post without fear, computer software (programs) must be shipped and handled with care. Tapping a disk on one's desk or leaving it on the car seat during a hot summer afternoon can eliminate any trace of your favorite program. Obviously, books are the better of the two when it comes to accessories required.

THE SCORE:
If I've totalled correctly, the computer wins on cost, interactive potential, motivation (at least for now), and in recording and reporting. The book wins in page size, print features, portability, access, visual comfort and health, and in accessories required.

Books win, six to four! In my opinion, the book remains a superior vehicle for displaying printed text. It needs no power source, no storage device, and no glare reduction; and it's super portable. I think books will be with us for years to come...but not telephone books...and not encyclopedias...and maybe not textbooks...

BEYOND THE COMPUTER: READING AS A PROCESS OF INTELLECTUAL DEVELOPMENT

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ABSTRACT

Recent technologies for helping or assisting reading specialists, such as the computer, can alter the reading-learning process. When technical advances are made, human patterns may be modified in subtle ways. The challenge for educators is to utilize technical devices without becoming too dependent on them. The goal is an informed person who will continue to learn, not a more efficient way to catalog data or grind out diplomas.

This paper attempts to explain how reading and the involved process of reading may be utilized to promote a range of ideas and enhance intellectual development. Reading and study skills specialists are frequently so busy developing basic skills, they fail to give emphasis to intellectual development. This intellectual activity promoted through the process of reading and critical discourse is usually left to classroom specialists. Perhaps reading as a medium for intellectual development should be given more emphasis and attention in the developmental laboratory..

One year after the death of Napoleon Bonaparte in 1822, a brilliant but cantankerous mathematician named Charles Babbage completed the construction of an advanced adding machine. Babbage first wrote about his new device in 1833. He initially called it a difference engine and later referred to it as the analytical engine. This machine has been acknowledged as the world's first universal digital computer. The British government subsidized the task of building a full-scale version.[1]

Babbage worked on his machine for nearly 40 years. As an interesting footnote, Lord Byron's beautiful and mathematically gifted daughter, Ada, became Baggage's confidante and public advocate. The Pentagon recently named a computer language after her. Ada will replace eight separate languages being used by the three military services.[2]

The computer may have had its beginnings in the nineteenth century, but it did not become a well-known or understood technical instrument until after World War II. The need for computer technology to control and predict became quite obvious as our scientific talent produced more complicated and demanding technical devices. Computers have been identified as the central nervous system of a high technology environment.

The remarkable achievements of science from 1650 to 1800 characterize what is known as the Age of Reason. These scientific developments are the basis of modern high technology. Technology embodies physically what science has already done. The word technologist was coined in 1854.[3] In 1859 Charles Darwin's Origin of Species appeared. In 1866 Nickolaus August Otto and Eugen Langer were building a practical internal-combustion engine in Germany. In the 1870's James Clerke Maxwell developed the theory of electromagnetism. William K. Roentgen discovered the x-ray in 1895.

It has been said that the nineteenth century represents the great potential of technology.[4] If this is true, it might be appropriate to say the twentieth century represents some serious failures of technology. Nuclear weapons and uncontrolled toxic chemical waste are good examples. About 80 years ago George Santayana said with considerable foresight, "The possibility of essential progress is bound up with the tragic possibility that progress and human life shall some day end together."[5]

In many ways our sophisticated technical achievements in the post-World War II era are due to computer technology. The first electronic digital computer in the United States was unveiled at the University of Pennsylvania in 1946. It was a collection of 18,000 vacuum tubes, 70,000 resistors, 10,000 capacitors and 6,000 switches; it occupied the space of a two-car garage.[6] Within a few years Bell Labs built the first solid-state (transistorized) computer, and the high-tech boom started. Computer technology is used for: guidance of missiles, space travel, fuel efficiency controls on automobiles, medical research, managing payrolls, checking inventories, collecting, storing, and making calculations with extremely large amounts of data. These uses represent only a small portion of computer applications.

In the early 1950's the National Bureau of Standards, about 30 miles north of Washington, D.C. near Gaithersburg, Maryland, had a sophisticated computer known as the Washington Oracle. This Washington Oracle is said to have made the decision to recall General MacArthur from Korea after it calculated equations containing strategic and economic variables of his plan to bomb China. The largest and most advanced computers now available to any government bureaucracy on earth are thought to belong to the National Security Agency located at Fort George C. Meade, an Army base seventeen miles northeast of Washington, D.C. They have:

> Computers to break codes. Computers to direct spy satellites. Computers to intercept millions and millions of electronic messages transmitted by friends and enemies from every corner of the globe. Computers to recognize certain target words in spoken communications. Computers to store, organize and index all this information so it can be retrieved when needed.[3]

The most recent and perhaps most spectacular innovation in computer technology has been miniaturization along with reduced production costs. If automobiles benefited from technical improvements the way computers have, it is estimated a Rolls Royce would now cost $2.75, get 3,000,000 miles to a gallon of gasoline, and have the power to propel an ocean liner.[8] To emphasize this revolution in computer technology Time magazine's Man of the Year for 1982 is not a person; it is a machine, the computer.[9]

There are now more than 100,000 computers in our public schools (one for every 400 pupils) compared to 52,000 only 18 months ago. Within five years this number is expected to surge to 2,000,000. A University of Minnesota study projects that 85 percent of the nation's school districts will have computers available to students this school year.[10] Minnesota leads all other states with one computer for every 50 students and a locally produced collection of 700 software programs.[11] The Minnesota Educational Computer Consortium, a nonprofit state-run organization, designs its own software.

These dynamic technical expansions continue to grow with almost certain penetration into all school systems. "Science teaches us to bow before the facts, however insignificant the fact may seem."13 Technology speeds this process. In other words there seems to be an urgent, vacuous demand for computers in public school systems based on the technical ethos of efficiency.

INTRODUCTION:

For reading and study skills specialists within higher education, computer technology may be able to supply a needed assist to overworked professionals with serious problems. "Its capacity for almost infinite memory, its flexibility and responsiveness to the learner make it the most enticing technological advance in education."[14] But there are many tough questions to answer. Does computer technology enhance or restrict intellectual development? Can computer-assisted instruction (CAI) make a difference with severely handicapped readers? Can students learn to debate or challenge the decision of a machine? Do students learn to be submissive in the presence of a computer?

It may be difficult to know exactly

what the educational pitfalls of CAI are. Experience with CAI in college reading labs is somewhat limited due to specialized software needs and lack of wide acceptance. It is known from industry that video display terminals (VDTs) are associated with four broad categories of health problems: alleged radiation hazard, visual disturbances, muscular-skeletal difficulties, and job stress. Educators need to be aware of these potential problems if students use visual display terminals for extended periods of time. In industry VDT workers usually find their jobs to be enjoyable, but 75 percent have physical or stress-related complaints attributable to the use of the terminal.[15]

Most universities and colleges are using some elements of computer technology to support reading and study skills centers. This includes everything from collecting and making calculations with data to using programmed instructions on video terminals. Two-thirds of senior high schools have microcomputers available for instruction, using them most frequently to teach computer science. About six percent of senior high schools in this country have computers (microcomputers) available solely for remedial use.[16]

Nearly 20 years ago Raymond E. Callahan wrote a book titled Education and the Cult of Efficiency. Callahan was somewhat ahead of his time when he pushed the thesis of industrial efficiency corrupting educational values. "In American education," he said, "it is important to be able to say that one's school system is abreast of the latest developments."[17]

Being abreast of the latest developments does not necessarily contribute to a student's education. The Carnegie Foundation for the Advancement of Teaching recently commented on the history of classroom technical innovations: "Virtually every new piece of hardware introduced into the schools in the past three decades has been oversold, misused and eventually discarded."[18] Academic hoop-jumping with machines cannot be defended with the argument that ignorance will be the lot of those who have not been put through it.[19] In the case of computer technology, it only gives us back ourselves. "It is a faithful mirror that reflects the human traits that are brought to it."[20] The computer might give back to us the face of arrogance, of ruthlessness, and the lust for power.

William Barrett has identified a key point for educators within a high technology environment. He said, "The difficult thing is to condition people in some positive way that will lead them to be free to develop whatever possibilities they have."[21] This thought is not a new concept for educators. Indeed, reading and study skills teachers are quite sensitive about their unique responsibilities as educators. But how sensitive is the computer? Many people consider the computer, an electro-mechanical machine, to be nearly infallible. Ludwig Wittgenstein, speaking with a highly suspicious tone on the topic of certainty, once said, "At the foundation of well-founded belief lies belief that is not founded."22 Computers distribute well-founded beliefs.

COMPUTER EFFICIENCY AND READING:

Michael L. Kamil has identified three signficant contributions to reading research from computer technology: data collection, analysis, and simulations (modeling and programming).[23] Computer technology has been able to help with data collection and analysis within many large institutions of higher education for nearly 25 years. Microcomputers now allow educational institutions with smaller budgets to have excellent computer facilities. Computer flexibility and responsiveness to teachers and students make it not only enticing but practical.[24]

CAI within the reading laboratory is a relatively new instructional technique, and in some quarters it is quite controversial. The first major efforts to use computers in teaching reading were those of the Brentwood Project, later called the Stanford Project. This initiative was launched in the early 1960's, and the computer did little more than allow for drill and practice on relatively isolated skills.[25] Considerable advances have been made since then. Current research by Steven A. Hillyard and Marta Kutas of the University of California at San Diego is attempting to identify brainwave patterns with a computer. They want to be able to test a student's verbal skills with this brain-wave technique and identify those with reading disabilities.[26]

Due to computer sophistication and increased utilization, CAI seems to be on the threshold of universal use within educational institutions at all levels. Some claims have been made for the effects of CAI, but they are rather general and perhaps a little extravagant:

1. CAI can be used successfully to assist learners in attaining specified instructional objectives.
2. There is substantial savings in time (20-40 percent) for learning over traditional instruction.
3. Retention is at least as good, if not superior, to retention following conventional instruction.
4. Students react positively to good CAI programs.[27]

Researchers and practitioners have identified some problems with CAI by asking these questions:

1. What are the most effective CAI strategies? What is best in terms of feedback? Are different paradigms better for different areas?
2. How do individual learning styles interact with CAI? How much cognitive complexity can students handle?
3. What are the effects of individual learner characteristics in CAI situations (e.g., memory span, perception, I.Q., motor skills, sensory preferences, and literacy levels)?
4. What hardware configurations are most effective, efficient, or necessary? How important are audio outputs, touch panels, video capabilities, or light pens?

5. How does affect relate to CAI? What are the roles of motivation, persistence, delayed gratification, or locus of control?
6. What are the most effective strategies for program development? How should programmers and practitioners relate to each other?
7. What are the most effective strategies for integrating CAI with other instructional activities?[28]

According to Michael Kamil these aforementioned questions will shape the future of computers in reading instruction. Kamil's article, "Technology and Reading: A Review of Research and Instruction," is a significant contribution to the literature of computer assisted instruction.[29]

Another excellent monograph titled, "Computer Applications in Reading" by George E. Mason and Jay S. Blanchard presents a review of the history and use of computers.[30] They also describe reading, drill and practice). With a dependence on visual effects, Mason and Blanchard wonder if computers are helping or hindering?

About 12 years ago Martha J. Maxwell wrote an article for the Journal of Reading Behavior titled "Skimming and Scanning Improvement: The Needs, Assumptions and Knowledge Base." [31] Maxwell identified what she believes are six myths about reading that prevent students from developing skimming and scanning skills. Her third myth states that one need not practice on machines to learn to skim and scan. Maxwell said, "It is common knowledge in the reading field that machines are not necessary adjuncts to improving reading rate and that their effects are primarily motivational." 32 Students must not become dependent on a machine warns Maxwell. (Maxwell may have been thinking of projectors, accelerators, and tachistoscopes but computers are also machines.)

Perhaps some caution should be exercised by reading specialists when students exhibit a keen fondness for working with the computer and other mechanical aids. The goal is to read (books, periodicals or magazines) and think independent of computer-assisted programs. At some point teachers must unplug the computer and send their students off to read books.

There is some research that indicates teachers must be enthusiastic readers themselves in order to influence their students to read. Active adult readers, according to research findings, have been influenced by their parents, who read to them at an early age, who read themselves for enjoyment, and who owned many books.[33] For severely handicapped students who cannot read, teachers often function as a surrogate parent as well as learning facilitator. This parent role can never be accomplished by a computer.

Reading habits as a rule are not initially developed at the college level, but they must be nurtured in some way or another. Important skills that seem to precede lifetime reading habits are: critical reading, flexibility, and context vocabulary development.[34] Computer technology may help students with the ability to read but not with the *desire* to read independently. This desire to read involves a mixture of family characteristics, personality traits, and motivational factors (e.g., teachers, campus stimulation, and self-gratification or enjoyment). The business of education is to turn out students with imagination, desire, capactiy for choice, and initiative or will.

READING AND INTELLECTUAL DEVELOPMENT:

Beyond computer technology are: individual initiative or self-motivation, thoughtful contemplation, and the power to reason things out after reading and studying on a topic. These human activities have been developed and used before computers came along. Reading as an intellectual activity obviously goes beyond the confines of a video terminal.

Making a bridge between the ability to read and intellectual development with books is a major hurdle. This problem is usually left to classroom instructors, but reading specialists understand their special obligation in this area. Some significant efforts have been made. Proceedings of the International Reading Association published in 1963 had as their conference topic *Reading As An Intellectual Activity*.[35] This was their primary concern. At this IRA meeting, Martha Maxwell said a complete reappraisal of goals and objectives within college reading programs is needed.[36] The idea was to expand reading's influence beyond narrow, remedial needs. This approach was welcomed, because it provided reading specialists with a challenging mission and opportunities to grow. But the self-motivated reader remains something of an endangered species.

It has been estimated that 20 percent of all readers account for 70 percent of all books read.[37] Readers of books, active readers, generally are better educated people compared to reluctant readers.[38] In a recent survey of retired teachers and administrators belonging to the Teachers Insurance and Annuity Association (TIAA), 92 percent of the respondents indicated reading was a major leisure activity they enjoyed.[39] These respondents are educated people who worked as educators or administrators before retirement. Twelve years ago a national survey representing 36 colleges announced that professors averaged 26 hours reading each week (15 hours were spent with books). Students averaged 17 hours a week reading (11 hours for course work and six hours for discretionary reading).[40]

Reading behavior appears to be related to good mental health and well-adjusted life style.[41] The early environment of an individual (first six to ten years) is a primary influence toward stimulating a capability to think in a divergent manner.[42] A college education usually enhances this capacity.

Teaching students to read is teaching them to think. Those who think, read.[43] It may be too early to know if computer technology can teach students to think. Indeed, many teachers ask themselves a similar question: "Have I made a difference?" Computers store facts, and humans change or modify facts by conceptual revolutions.[44]

Lewis Mumford, when he was 84 years old, made an observation about academic scholarship that is also most appropriate for computer technology. Mumford said, "Academic scholarship, in its efforts to be scrupulously correct, to be faithful to the text, to pass on only certified truths, too often keeps remote from the student the process of thinking itself, and defrauds the beginner of one of the great incentives to creativity: his bearing witness to the birth of an idea in another mind."[45]

Reading books provides ideas, and many prominent individuals have turned to books for insight into major problems. One of John F. Kennedy's first acts in the White House was to order 200 books placed on his office shelves for easy access. He called Barbara Tuchman's The Guns of August his presidential handbook due to the clear story of ignorance leading to misjudgment and then to catastrophe. Kennedy's recollection of The Guns of August was, according to him, a most influential factor during the Cuban missile crisis of October 1962.[45] Theodore Roosevelt (TR) was quite impressed with Upton Sinclair's muckracking novel, The Jungle, which graphically exposed conditions in the meat packing industry. As a direct result of this book's impact on TR, the Pure Food and Drug Act became law on June 30, 1906. TR read rapidly and widely; he also authored some 35 books and a staggering 150,000 letters.[47]

Harry Truman also liked to read, and he particularly enjoyed history. George

Marshall read quite a bit and thought a lot about what he read. Lyndon B. Johnson took a speed reading course, but confined his reading to government memos and official documents. Herbert Hoover read slowly and limited his efforts to technical material. Calvin Coolidge liked to read the comics and on occasion, when he went on vacation, had someone call King Features to learn what was going to happen to Ella Cinders or Orphan Annie. Dwight D. Eisenhower enjoyed westerns, and he especially liked Ernest Haycox westerns. Ike sometimes requested galley proofs be sent to him. Moe Berg, the Boston Red Sox catcher, knew three languages and read books in all of them; he later worked for the Central Intelligence Agency. In the Senate, J. William Fulbright, Wayne Morse, and Paul Douglas read constantly on numerous topics.[48]

One of the most prolific readers and perhaps the best example of how reading can expand intellectual powers is Eric Hoffer. Hoffer taught himself to read English and German at the age of five. After working at odd jobs in manual labor for 20 years, he joined the International Longshoreman's and Warehousemen's Union in San Francisco in 1942 when he was 40 (this was his first regular job). He worked at this job for 25 years. He had no mentor or formal education, but he continued to read books from the public libraries of California until he died this year at 80. Hoffer also taught himself how to write; he published eight books and numerous articles while working as a longshoreman. Reading and independent study seem to be the key to Hoffer's intellectual development and literacy success.[49]

SUMMARY:

Computer technology from Charles Babbage's 1822 analytical engine to sophisticated minicomputers in the 1980's represents in some measure the power of technical progress. William Barrett's suspicious nature of technology represents a serious criticism and could be the basis of legitimate concern: "Technology in the twentieth century has taken such enormous strides beyond that of the nineteenth that it now bulks larger as an instrument of naked power than as an instrument for human well-being.[50]

As an instrument of naked power, computers keep our monistic, electronic nervous system moving extremely fast within an environment restricted by nature, i.e., human abilities. If reading specialists can be relieved from the tedium of routine developmental tasks through the use of computer technology, then good. If computers are used as a substitute for teacher interaction, then subtle limits (affective concerns) will be established during student development. Eric Hoffer has expressed this requirement for human contact in cogent terms: "Even without censorship literature and art will not thrive where there are no friendships, no free conversations, no shame and no extravagant dreams."[51]

Computers only have the power that humans bestow to them. Once in power, computers force individuals into preselected technical paradigms that are synthetic creations. Human thoughts are vicariously filtered through the computer back and forth with defined combinations. This kind of exchange may condition a student to master the computer without an understanding of purpose or a knowledge of human limitations. It enriches the spirit without touching the soul.

Computers in a reading laboratory will not be able to provide intellectual stimulation at levels expected from academic classroom participation. Initiative and careful analysis are parts of a disciplined, somewhat creative process within education. Moreover, computers might prove to be restrictive, rigid, and foster mechanical patterns of thought. William Carlos Williams once said the only human value of anything is intense vision of the facts.[52] The element of creativity or independent thought will always be difficult to simulate through a machine. For all the mechanical elegance available to us, there will always be problems a computer cannot solve.

There are no short cuts to being educated or learning how to read. Reading books, thinking, and reasoning through problems are developmental tasks requiring considerable individual effort. With soft, plain words William Faulkner put it this way, "I learned that, to be a writer, one has got to be what he is, what he was born."[53] The goal is a person who can think for herself or himself independent of programmed learning techniques whether they be in the form of simple written instructions or fancy electro-mechanical devices.

An education can produce independent thinkers, and it can also produce narrow conformists. There will always be a need to go beyond the computer for our answers. When we fail to do this, our lives will merely be an extension of our machines, and conforming will be a major educational objective.

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THE TECHNICAL REVOLUTION AND INNOVATIVE READING/LEARNING TECHNIQUES

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ABSTRACT

The "Technical Revolution" which characterizes the age in which we now live places great emphasis on higher order thinking skills. The transformation to an information society occurring so rapidly places a premium on a new kind of literacy. The effects of both of these changes impact on education in the form of computer technology. This article discusses the function of computers in education as a tutor, tool, and tutee.

SKILLS FOR AN INFORMATION AGE JOB:

In 1950, approximately 65 percent of the labor force was involved in industrial occupations. Now, in 1983, 27 percent is and the percentage of the labor force in information processing or high tech industries has increased from 17 percent (1950) to approximately 60 percent today. (John Naisbitt in Megatrends)

We are no longer an industrial society, but an information technology society. That is, we have a growing dependence on high technology for economic growth and national security. Rapid advances in communication and computers are changing our businesses, schools and home life. This changes what we need to learn, how we learn, who will learn and who will provide it.

The skills needed for the assembly line mass production of the industrial age will not necessarily be the skills most needed in the new information society where robots and other mechanized ways of producing goods will and have replaced people's jobs.

An Educational Commission of the States' study reported "seven high order thinking skills needed for survival in tomorrow's high tech society."

--Evaluation and analysis
--Critical thinking
--Problem solving
--Synthesis
--Decision making
--Communication
--Creativity

All of these skills should sound familiar to reading teachers.

Some examples of skills used in my information technology job I moved from teaching (5 years) into developing computer-based educational courseware for time-sharing computers (2 years) then to editing CBE materials for microcomputers (1 year).

I made my career change three years ago due to changes in education, not to mechanization in my field. However, the requirement for the learning I had to acquire is quite similar to what will happen to workers who move into other information technology jobs--many of whom will move because their jobs have been eliminated by technology.

What did all this mean to me? What support skills did I have to use? Strangely many of them are the very ones I covered in the study skills course I taught earlier:

--Preview reading material
--Skimming and scanning
--Outlining written communications
--Set and revise goals and objectives
--Plan my time
--Be flexible; allow disasters
--Keep balance in my life

What this says to me, is that those skills we teach to help students succeed in school are also necessary on the job. More importantly they become critical when a person changes jobs. Each new situation will require different applications. Lifelong learning is a reality, not a fad.

COMMENTS FROM A FUTURIST:

A futurist I heard speak recently, a man named Earl Josephs from Sperry Univac, a Minneapolis electronics corporation reported some interesting facts...

--50-70 percent of Americans work in "Information Age" jobs
--Robots now cost about $3/hr. for assembly line type labor--this figure rapidly will move to $1/hr.

Compare this to $20/hr. for a person

--Soon you will no longer need a manual to help you run your computer. Computers will be so user friendly

they'll anticipate your every confusion or misdirection.
- --Artificial Intelligence will soon allow all of us to communicate with computers whether we know a programming language or not.
- --We are rapidly moving from the "box" computer to the "wafer" computer. The computer of the future will be embedded in our toasters, refrigeration and vacuum cleaners. Texas Instruments presently has "wafer type" which housed in a miniature cassette can deliver a computer program with color and speech.

What does this mean for us and for present students? I think it means a continuation of an even faster paced change rate. Even those computer programmers who have had the pick of jobs until recently are going to have to be able to regroup, refocus, relearn and adapt.

OFFICE OF TECHNOLOGY ASSESSMENT REPORT:
In October 1980, the U.S. Congress House Committee on Education and Labor asked the Congressional Office of Technology Assessment to "examine the extent to which information technology could serve American needs in education and training. The report was released at the end of last year. Let's take a look at some of the summary findings.

Some sociologists believe that changes in manufacturing and office automation will increase rather than decrease the skill requirements for workers. An increasing number of jobs will require the use of information systems or new manufacturing techniques. Vocational and industrial training programs will need to teach skills such as robot maintenance and word processing.

There is debate about what kind of workers will be needed to perform the tasks of future jobs. But (according to the OTA report) many experts do not see a surplus of college graduates. Rather they see a lack of qualified graduates who have the knowledge and skills needed for design of the new technologies.

The second part of the findings is that an increasingly higher social and economic price will be paid by those who don't adapt. A significant social, economic, and political gap could develop between those who do and don't have the ability to access and use information systems, and adapt to new jobs.

A recent radio story reported the nominating of George Orwell for the next presidential race. Our educational institutions have a big responsibility in ensuring that a scenario similar to what Orwell described in 1984 never occurs. Schools need to become technologically literate in order to support students in acquiring this kind of literacy. Business, industry and educational institutions must work together to assure that training programs are up-to-date and available where training is needed. This will likely entail more training in the work place and in the community.

NEW DEFINITION OF LITERACY:

So what does all of this mean for reading instruction? The basic skills of reading, writing, and computing will no longer suffice for survival in our new society. Literacy will include the seven thinking skills I mentioned previously. It will include a basic knowledge of how computers work and how to operate them. And I believe it connotes a change in curriculum for our schools. The National Commission on Excellence in Education last week called for high schools to add a half year of computer science as a requirement. I want to tell you a story...Math colleagues who thought problem solving skills were uniquely a math domain...were surprised that reading teachers considered them a reading skill.

These thinking skills are content specific only as far as reading in the content areas refers to content specific reading skills. Students must be able to apply them across subject areas and in daily life. These are the skills that will allow them to train and retrain and adapt to change. Computer literacy shouldn't be something a person learns only in one or two math courses. Computer use and understanding should be part of all content areas where computers are useful---from data base applications in the social sciences, to spread-sheet analysis tools in business, to word processing in English composition.

At the same time, we need to support research and development to study technology in education. We need to continue study of learning strategies and processes, cognitive development, what constitutes effective educational software, and long-term effects of the psychological and cognitive impacts of technology in education.

Let's take a look now at the ways computers are and can be used in teaching reading and in learning skills centers. A popular approach has been to talk about the computer used in education in three ways. I'm going to use the analogy from R. Taylor's book, The Computer in the School: Tutor, Tool, Tutee. Good tutor type programs record data on performance and summarize it for the student and/or teacher to use for instructional decision making. They can include pre-testing and post-testing and long-term record keeping.

THE COMPUTER AS TUTOR:

Some examples of tutor reading programs include:

- --Control Data's Basic Skills and High School Skills Reading Series for Texas Instruments 99/4A or the CD110 microcomputer.
- --Computer Curriculum Corporation's Reading Materials
- --Dolphin Reading Curriculum (Houghton Mifflin-elem.).
- --Other smaller, individualized courses and lessons...elicit audience responses to this.

THE COMPUTER AS A TOOL:

The computer functions as a tool in those situations where it is used to help solve problems. This might be in helping to generate a written document faster and more efficiently, in calculation, in researching information or in modeling real world phenomena for investigation.

Some examples of uses of the computer as a tool are word processing, spreadsheet analysis packages and data bases.

Word Star and Bank Street Writer are popular word processing packages. Some word processing programs are able to incorporate spelling check programs and editors which evaluate sentence syntax and style.

Visi Calc is the best known spreadsheet analysis program. Recently the same company which created Visi Calc published a package called TK Solver (Tool Kit Solver). This tool allows the user to set up problems, vary assumptions, find solutions and display the results. The product was designed for engineering and business, but a high school version is also being developed for applications in chemistry, physics, and biology.

ERIC is probably the best known data base for educators. Most libraries now have access to a variety of data bases to help students locate information.

Microcomputer-based instrumentation packages allow students to perform lab experiments for phenomena such as harmonic motion, mechanics, cooling and warming curves and human physiology measurements. These activities take away some of the expense, drudgery and time required for laboratory experiments and leave the student freer to focus on the scientific event under investigation.

THE COMPUTER AS A TUTEE:

The computer is a tutee when it takes directions from the student. To do this, the student programs the computer. Of course, there are many levels of programming difficulty. LOGO is a popular approach for teaching students to program a computer. The main benefit in using the computer as a tutee is that in learning how to communicate with the computer, one learns how computer logic works and how his or her own thinking processes work. In programming graphics, one learns geometric principles. In addition to LOGO, GraFORTH is an example of a student programming language designed for learning how computers work.

A related example to programming languages which tutor the computer are "micro worlds." A micro world is a computer program which constitutes a subset of the real world. It is structured to match the elements or follow the rules of a given mechanism or pattern. Students learn the rules of the mechanism or pattern. Students learn the rules of the mechanism or pattern by interacting with it--giving it directions, asking it questions, and receiving responses or reactions. LOGO can be considered a micro world in the sense that it immerses a student in programming procedure. Another popular one is "Rocky's Boots" which teaches the rules of digital logic. In this package, preschoolers activate logic gates and flip-flops to explore this micro world of digital logic.

OBSERVATIONS ABOUT COMPUTER TECHNOLOGY IN EDUCATION:

Computers are not yet being used to their potential. Too often they are solely drill and practice machines. This is not intended to denigrate the drill and practice function of computers. That is one very suitable application for them. Unfortunately not enough instructors know how to use computers as tools or how to help their students use them as tools and tutees.

Most current educational software is not of very high quality. Massive quantities of drill and practice materials are available, but few tutorial activities and even fewer simulations are around. Educational games tend to be extrinsically, rather than intrinsically motivating--that is, the motivational aspect of game activity does not directly relate to the concept being taught.

Much of the software on the market is neither easy to use nor easy to learn to use--two criteria which are basic guidelines for evaluating good software.

Learning Skills Centers are ideal places for all uses of microcomputers in a college, if the center is appropriately staffed.

- --Tutorial/drill and practice activities can be made available for individualized review/remedial work.
- --Students can use word processors to prepare papers, and get help on organization and mechanics in the same setting.
- --Students can get help in using tools such as data bases or Visi Calc.

Skills Centers might be seen as the central resource for help with computer and non-computer related skills with instructors from subject areas available.

Some colleges, beginning in fall 1983, will require incoming students to have their own personal computer. Beginning this fall, Clarkson College of Technology in Potsdam, New York, will issue each freshman a Zenith micro for which the student will pay $200 per semester. Accompanying software will include a spreadsheet program for financial analysis (a la Visi Calc) and a word processing package. The students will also be able to network to the college central computer and to each other or their instructors' computers.

What do student issued personal computers mean for learning...?

--More individualized instruction
--Easier record keeping for instructors and..
--Use of time saving/powerful tools for problem solving
--More and more colleges will surely follow this lead

To conclude I'd like to emphasize that we all need to learn about technology as part of our life long learning. It is critical that people who are making decisions in the field of education have a perspective on technology and how it relates to our work lives and our other needs for self fulfillment. Technology is causing change to occur. We have to learn about it so that we can use these changes to our advantage. Without knowledge one has no perspective and without perspective one can become a victim of change.

We can look at the changes technology is bringing to education as problems or challenges. I like to look at them as challenges.

To me, change is what learning is all about.

THE TEACHING OF READING IN TECHNOTRONIC TIMES: VALUES AND GOALS CLARIFICATION

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ABSTRACT

Computers have become part of the educational scene and promise to play a significant role in the teaching of reading. Dr. Howie explains how the theoretical models of the nature of intelligence, by determining the types of processes controlled by computers can affect the learning outcomes of instructional programs. By comparing human intelligence with artifical intelligence, she alerts the teacher to potential pitfalls in the use of the computer to teach reading.

Computers are in our lives and influence the field of education as they do most other aspects of our society. We cannot as educators afford to be "Ludidtes" fearing that machines are our enemies, which threaten our jobs and our lives. Ned Ludd was a 19th century weaver who smashed a knitting machine in anxiety that his life would be changed forever by it. Our lives are changing, and our task is not to fear, but to find intelligent ways to adapt and control changes created by the computer. We can do this with careful direction and a curriculum that benefits our students and the teaching of reading. To formulate such a curriculum requires knowledge of the function of the computer, a clear focus on what we value in teaching reading, and identification of goals aimed at those values. We may have to redefine our role and the roles of the students and the computer in order to adapt technology to our purpose.

There are differing views on the use of the computer. One view sees it as an extension of the human brain in its ability to simulate human experience, to store knowledge, and to process information at superhuman rates. Others see it as imitator and indicator of human intelligence. These models of cognition are based on a limited aspect of human intelligence involving information processing. The view of learning as information processing holds that the cognitive system is a set of memories containing symbols and symbol-manipulation processes that act upon the memory store. Cognitive processes manipulate the symbols that are acquired as information from the environment by perceptual means. Most intelligent computer programs for education are based on models of cognition that computer scientists and psychologists use to theorize how learning takes place in humans.

Some of the most popular models of cognition currently used follow in necessarily abbreviated discussions and may be read in detail in Cohen and Feigenbaum's three volumes (1982) and in the original papers (see References). The Information Processing System, or IPS, was devised by Newell and Simon (1972) to explain processes involved in general problem solving. Briefly explained, it describes an existing state (existing symbol structures) that undergoes a sequence of processing information: discrimination, tests and comparisons, symbol creation, selecting or designating parts of the symbol structure, inputing and outputing the structures, storing, and retrieving. This sequence of step-by-step procedures is based on a theory of how humans go about solving problems.

Another model of cognition that theorizes on the processes involved in human planning is Opportunistic Problem Solving (Hayes-Roth, 1978). It is describing two styles of control in planning. The first control is bottom-up in that the perception of immediate, obtainable goals results in adjustments and integrations of new plans whenever a need to do so arises. It is a multi-directional style of control in contrast to the top-down or hierarchial steps style that is unidirectional and prescribed.

The Semantic Network System (Quillain 1969) theorizes that humans learn new concepts through semantic relationships. This system explains recognition memory processes. A definition contains a set of associations and concepts called a plane, with its concepts called type nodes and its examples called token nodes. These planes are linked together, type nodes (concepts) and token nodes (associated examples of the concepts) throughout the associative memory.

Two models of cognition based on input of syntactic structures are Human Associative Memory of HAM (Anderson and Bower, 1973) and MEMOD (Lindsay, Norman and Rumelhart, 1972), a general knowledge system. Both are concerned with long-term memory. HAM theorizes that all knowledge is represented as propositions (sentences containing predicates, concepts and arguments) encoded in syntax trees. HAM accepts input sentences and builds associative structures of them in memory by searching for paths in the memory to match new information. Only the links in a code of memory are followed that have the same label terminology as links from the corresponding node in the input tree. The model MEMOD has three components: a parser (for the syntax tree), a node space that is a semantic network representing world knowledge, and an interpreter that performs operations on the node space. The node space structures represent facts, and the node space represents declarative and procedural knowledge regarding their functions. The node space is not a passive repository of knowledge, but contains procedures that actively manipulate knowledge. The meaning of a concept lies in its structure which is composed of simpler units of meaning arrived at through a process of "semantic decomposition." A simple propositional sentence consists of the structure of a relation and a set of concept arguments (indicating relationships of the concept such as classifications, examples, properties, etc.). Knowledge is first supplied to MEMOD in the form of sentences, parsed, then interpreted by executing the program associated with each relation in the input sentence. Both of these models theorize that humans learn and remember through these associative, sequential processes.

The value of knowing about such models of cognition is that they underlie many of the computer programs we use with students in training them. There is a danger in such models in that they compare artificial intelligence to human intelligence. The term artificial intelligence is distinguished from mere mechanical computation and requires such processes as ability of the machine to sense the environment, learn and have a memory, plan to solve problems, and reason inductively and deductively. At this time computers cannot really "think," but must be programed to carry out certain operations. In some programing (such as heuristic) computers appear to be able to think independently because they are programed to "discover" answers and come to conclusions, but computers, as yet, cannot think independently from their programing.

How does artificial intelligence compare to human or "real" intelligence? Human intelligence has been defined by Cohen (1975) as "whatever the computer cannot do," and that is possibly the real comparison. In function, the computer receives facts called bits of information, stores them, then acts upon them in a logical, step-by-step way. Yet, to a human, reality contains an almost infinitive number of bits which the human perceives as part of a total picture through the senses. The computer is a passive receiver whereas the brain is an active reactor that organizes reality to suit its own needs and has preselected the facts. Most computers can solve only one type of a program at a time such as translating, problem-solving, and game-playing whereas the brain is much more versatile. The computer lacks the flexibility of the human mind (defined by psychologists as processes of the brain) with its number of possible brain states and range of human responses. The digital computer must be programed in steps of simple operations in binary arithmetic using only the digits 0 and 1 coded in binary digits (bits) based on the power of 2. Computer programs are designed for simulation of hierarchical cognitive functions of human intelligence, not other more complex functions of creativity, sense of self, independent action, criticism, "free will," etc. In sum, computer models of cognition are limited only to those functions of the human brain that operate like a computer.

Understanding these limitations of computer programs and their undergirding cognitive models, educators gain a clearer understanding of their use in the overall reading curriculum. Computers have their use in the reading curriculum in providing tactile, visual, and even auditory experiences that reinforce concepts taught in the classroom. Most current computer programs promote development of reading rate, vocabulary and spelling skills, specifically. A person learns to read by reading whole texts that have structure, unity and cohesion. The reader becomes skilled in recognizing patterns in text, predicting from such patterns, and integrating the symbolic parts into meaningful wholes. Using a computer program that teaches isolated skills in reading may damage the whole-text approach that must be used with students. The computer program can provide routine drill and rote learning practice, but the reading teacher has to synchronize and synthesize the drill with the actual process of reading text. The reader uses an active cognitive process derived not just from the brain, but from the entire nervous system, electrical impulses, and sensory apparatus, all of which give input to the brain in interpretation of environment. In other words, in teaching reading, we are dealing with an entire human being, not a "meat computer" (Cohen, 1975) preprogramed solely with a hereditary and environmental memory storage and utilizing rote learning.

The goal of computer-assisted instruction is individualized instruction, thought by some to be preferable to classroom lockstep instruction. Scheduling of time, place and duration of instruction can be individualized, it is true, but making a fixed instructional sequence tailored to an individual is a complex problem not yet mastered. Most current software does not provide for individual differences such as personality, interests, or attitudes. Human interaction between teacher and student is a far more sensitive medium for individualizing the teaching of reading.

Another problem associated with use of the computer in teaching is the narrowness of its goals in developing the full potential of each human socially, morally and culturally. One study (Feldman and Sears, 1970) indicates that computer instruction in the elementary school decreases the tendencies of students to interact socially. In using the computer, a student is socially isolated and does not gain from comments and reactions of classmates as in a classroom setting. Individualized instruction can be taken too far and harm a society where individuals must be socialized and learn to cooperate within a group for group goals and cooperative productions. The teaching of reading should encompass the goals of socialization and exchange of ideas and higher levels of thinking.

As we see, there are severe limitations in using the computer to teaching reading which affect the student cognitively and effectively and methodologically. The educator must note these limitations and set plans that account for them. Primary consideration should be given to purposes for reading. Is the purpose for reading to learn to use a computer reading program? The purpose of reading is always to gain meaning from printed stimuli. Once a student learns to read on the computer, is there automatic transference of the skills learned to the printed page? The answer is no, such transference must be taught in a carefully constructed curriculum by the guiding teacher. There are computer programs that teach isolated skills, but our goal in reading is to teach integration of text with reader factors for the purpose of gaining meaning and enriching reading experience. The cognitive models used on the computer provide a limited, narrow learning compared to the complexity of the human mind in processing information. Most computer programs deal only with the literal level of thinking in their step-by-step logical sequencing. Our purpose in reading is development of thinking beyond the literal level to abstract interpretations and applications of knowledge. The computer teaches the brain cognitive knowledge, yet our goal in reading is reaching the whole person, the body along with the brain. In reading we deal with emotions, impact of feelings as well as ideas. Memory associations in humans are tied to the affect, the emotional experiences associated with knowledge and background. In teaching reading we maintain a psycholinguistic emphasis involving the whole human, not just the mind.

With clear declarations of our purposes and goals in reading, we will be able to keep technology in perspective. The latest report of the Carnegie Foundation for the Advancement of Teaching cited by the Washington Post (August 28, 1983) criticizes the misuse of computers in the classroom in schools that "buy now, plan later." The report said most schools are buying them "with little thought as to how they will be used and what larger educational purposes will be served" because computers have become a "flashy symbol of school success." We must avoid the tendency to jump on the bandwagon by buying and using computers because it is the fad to do so. We want to use the computer, value it as a tool for teaching reading, but not make it a substitute or a panacea for teaching reading. It is a tool limited to specific tasks not suitable as an entire curriculum. The role of the teacher is seen as orchestrator of the interfact (interaction of human and machine), constantly defining values and setting goals, and evaluating effects of a carefully managed curriculum. The computer's role may be envisioned as a tool to test, guide, and store data of student progress in learning. The computer is not the teacher but is a reinforcement of concepts taught by the teacher. The most important component, the student, has the role of active learner integrating experience and knowledge with new information in the exciting process of learning to read. Teacher, student, and technology can all interface successfully in the learning situation.

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THE COMPUTER: NO UTOPIA

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ABSTRACT

Harry and Marie Cowart discuss the impact of computer technology on education, compare the newest innovation to earlier ones, alert us to problems in the effective implementation of the computer in education and suggest principles which should guide us in the implementation of CAI in a fast changing world.

Recently our educational system has again been shaken by the development of the microchip. The first educational awakening in this century was sparked by the launch of sputnik. With that launch, educators were shocked into the realization that advanced science and mathematics courses must be taught. This led to the formation of the National Science Foundation which provided the momentum needed for upgrading the teaching of mathematics and science courses and provided financial resources for training and retraining teachers in these two critical areas. This change in emphasis and attitude toward math and science has produced astounding results in the areas of national defense and space exploration.

However, presently it is virtually impossible to find adequately trained science and mathematics teachers and the number of courses offered in these areas has diminished. Industry has drained the educational system of its math and science teachers. Industry has prospered and education has suffered.

Since the major funding of the Elementary and Secondary Education Act of 1965, the computer industry has become keenly interested in education. The industry knows that to make substantial profit, it must have access to the market that can afford to buy its products.

> "In the frenetic and ferocious world of personal computers, everything happens at hyperspeed. The machines operate in microseconds, and success or failure for a personal-computer manufacturer sometimes seems almost as rapid. More companies, new machines and a fresh crop of millionaires appear regularly.
>
> Along with such explosive growth comes unusually high risk. With technology changing rapidly, a delay in a product's introduction can cause premature obsolescence or instant eclipse." (Time, 1983)

Before a machine can be developed for which a program can be written, the machine is already outmoded. Secrecy and speed are necessary for success in the marketplace.

Industry leaders of today may well be out of business tomorrow. Thus, educators must concern themselves with companies having considerable expertise and knowledge in the field of computers.

> "The personal computer business today is much like the automobile industry in the early years of the 20th century. Then as now, a new technology was being developed with potentially revolutionary effects that attracted hordes of companies; some of them even had names like Apple and Commodore. Of course, only a few of those early automakers survived. No one doubts IBM has become the General Motors of the personal computer industry. Now the question is who will become the Ford or Chrysler and who will be the Locomobile or Stanley Steamer?" (Time, 1983)

With such a volatile industry and attendant pressures to influence the educator's selection of hardware, it is important that educators become wise consumers. (Nelson, 1969) The saying "buyer beware" is crucial and should not be taken lightly.

With present budgetary limitations, educators cannot afford to buy a "Stanley Steamer," they must have a "General Motors" product that will stand the test of time and daily usage. Unfortunately the companies which will ultimately survive cannot yet be identified. The Commodore Vic Computer purchased in our school district has been phased out even before programs could be developed. Consequently, we are left with the task of either developing our own software or junking our equipment.

The computer industry made a splash with electronic games like "Pac-Man" and "Space Invaders". Students flocked to arcades to play the games. While this market flourished for a couple of years, computer arcades seemed to spring up on every corner. However, thousands of these establishments have folded within the past few months. The computer industry has changed its sales emphasis from the video arcade to the home and school computer in hopes of capturing a new market. The newness of the computer game and much of the motivation have been lost and students are now seeking a new thrill.

Motivation is an important factor in the teaching and learning process and it can only be maintained when the task is challenging and stimulating for the student. The motivation to play a computer game is not the same motivation required to learn something new.

The computer is not a motivation utopia because of human elements limitations placed on it, neither is the computer a panacea to cure all learning ills.

We recommend caution and deliberation in planning for the utilization of the computer in education. Without such caution and deliberation, the computer may pass from the educational scene as did the Craig Reader, the Perceptomatic, the Hoffman Reader, and educational television, to mention just a few machines that have made their debut and have faded on the educational scene. All educational machines, utilized properly, have value, but neither the above mentioned machines in or the computer is "the panacea to cure all ills".

We perceive the computer as being the new star. We hope to prevent its fluttering and dimming because of the functions and processes of an educational system which tends to move too impulsively and recklessly in committing itself to the utilization of new equipment.

> "Educators have been too quick to leap on every bandwagon as a panacea to cure all ills in reading and education in general. Where are all the machines and equipment that have been introduced? Are they being used on a regular basis? We think not! Have test scores and reading competencies improved with the introduction of the hardware? If they have, why do we need computers? If the reading machines of the 1960's and 1970's succeeded in elevating the reading ability of students and in raising test scores, why would educators propose the implementation of computers? If the reading machines of the past several decades have not succeeded, why would we believe that computers will suceed where the other hardware has failed?

> Maybe the answer lies not in the hardware but in the human element, the educator. The instructor must incorporate the computer into the curriculum on a consistent basis and with extreme consideration for his/her organizational structural pattern. The attitude of the person and the individual's personality must also be considered. Another aspect is the extent to which staff development training has been included. To what degree has the instructor played a part in determining the actual needs of his/her students? Has he/she had input or has the administration decided that computers are an asset to the instructional program?" (Cowart and Cowart 1983)

Problems Associated with Computer Instruction

The applicability of computer instruction is directly proportional to the concreteness and specificity of subject matter. The more abstract and replete a subject, the less it lends itself to programming. As long as one confines learning content to specific segments involving factual data, one will find instruction well suited to the computer assisted approach. (Ornstein, 1969) However, in dealing with the higher level and/or more complex comprehension skills, the computer does not adapt well to instructional needs. Many software programs are inflexible and with "predetermined information" which cannot be adjusted to meet the individual needs of the students for which the programs were prepared. (Littlefield 1983)

The second problem, which relates back to the first, is one of neglecting the curriculum content because of the concern with the surface programming problems. We must be careful not to allow the curriculum to become too narrow in scope because of software program problems. (Suppes, 1967)

A third area of concern mentioned by Hechinger (1983) is that software programs have not encouraged "original thinking", we must provide for enriching the stimulus environment. (Suppes, 1967) After the initial impact, will boredom set in?

Both Littlefield and McCabe (1983) have agreed that part of the problem with the software programs has arisen because of the rush to keep up with supply and demand. Because of the concern to supply the industry with software programs, those actually selling the software have not had the opportunity to become sufficiently acquainted with the programs that they are offering. Because salespeople often lack an educational background, they may not understand how learning takes place and be poor judges of a program's educational merit.

Deborah McCabe (1983) described many software programs as not being tailored to meet the needs of students. She also explained that the software did not consider the various ways in which learning takes place. The various senses that one uses in the learning process have not been considered.

Students learn in various ways. Since all individuals are unique, each learns in his/her own manner. Some people are more visually oriented while others are more inclined to learn through the auditory or kinesthetic process. Henry Smith and Emerald Dechant (1961) stated that..."Reading is a visual skill but success in reading depends more on the underlying perceptual and assimilative process"...

An effective software program must be able to fit the unique learning styles of each individual, rather than force the learner to adapt to the particular program. We as educators must share our knowledge of how learning takes place with the business world so that the software they produce is of greater educational value.

Systems Approach

Computer assisted..."instruction represents the earliest phase of a systematic analysis of the teaching-learning process. Simply stated: Decide what is to be taught, determine the terminal criterion, and systematically explore the most effective and efficient means of helping the student meet the criterion.

The systems approach to educational planning requires precise analysis of the unique characteristics and capabilities of a variety of learning activities which can be used to attain objectives"... (Gleason, 1966)

Nelson has commented,

> "Concomitant with the introduction of the computer must be utilization of a systems approach, which Alfred Strogoff, vice-president of Litton Systems, has explained in this way: "This procedure begins with the development of curriculums based on carefully defined objectives, and involves the integration of materials and instructional equipment, as well as instruction itself. This is the systems approach to education." This seems both forthright and sound. The integration of instruction with both materials and equipment appears most desirable, and we educators, too, wish to base curriculums on carefully defined objectives." (Nelson, 1969)

Wilbur Schramm concluded that computer assisted instruction could be effective in helping student achieve specified behavioral objectives. The crucial task is to specify what we want the student to learn and the behavioral criterions to be met to demonstrate this learning. (Gleason, 1966)

It is important in evaluating CAI that the distinction between pedagogical and technological issues be understood.

> "Technology will produce fundamental and long-lasting changes in the curriculum

only if its applications are guided by appropriate psychological principles and subject-matter insight ...It is of the greatest importance...to emphasize that the existence of the technology and the recognition of its possibilities do not guarantee that it will be used or that it will be used with maximum efficiency. In many respects, the deep and complicated problems only begin when the technology is ready for application and decisions must be made as to how it should be used".... (Suppes, 1967)

Educational Reform

"Using instructional computers to catalyze education reform was emphasized nationally as early as 1970, when the President's Commission on Instructional Technology noted that formal education is not responsive enough to what is known about the process of human learning, particularly individual differences. The commission advocated using technology to change this situation.

Decisions about innovative approaches to educational reform should be built upon evaluations of the added values they offer. The people who run institutions,

> school systems, and communities must decide how much they are willing to invest to achieve various types of educational reform." (Seidel, 1980)

As with so many other innovations, computer based instruction will be limited in the area of implementation because we suffer from..."political naivete about the realities of institutional change"....(Barr, 1977)

..."Much of what is called reform is not really reform...some or most of.... are intended to refine schools in their existing form, others to redesign the very foundations of schools... There is a paradox...in school reform. The more achievable reforms - those tied to the 'structure' and the 'product' ...seem least likely to result in changes that are most difficult to achieve...the 'process' kind of reforms that might result in some fundamental educational reform"....(Stevens, 1976)

According to Goodlad (1977), we as educators need to..."rethink the entire educational enterprise"... Goodlad suggested that the future of reform... "lies less in having computers take over the work of the schools than in developing an ecology of education in which each institution...does what it can do best in an educative society"...Thus in the area of educational reform, Goodlad perceived the computer as..."a new source of instructional energy"...However, he believed that there needed to be..."clear differentiation of functions between computer based instruction and the schools and not one of competition over the performance of duplicating over lapping functions"....

We need to realize that the ..."employment of technology can offer a significant alternative to current instructional methodolgies"...Hence, according to Carruth (1977),..."It is another alternative not a solution"....

Fantini (1977) has suggested that to state that computer based education can deliver by itself all the educational objectives associated with universal quality education is to make assumptions ...that will be quickly challenged".... For..."computer-based education is a technological potential, not an educational guarantee. Its outcome depends ...on the design of its software...follow-up activities...on congruence of objectives...on the goals both manifest and hidden...and on the way the technology fits within and becomes part of the modus operandi of the class"...(Thelen, 1977)

Ralph Tyler (1977) has stated that... "technology can help with some of the tasks, but has limited value in others, especially motivation, developing confidence, finding meaningful rewards, encouraging new efforts, and helping with transfer"....

> The contention that only private industry can bring about the changes so badly needed in education and will do so only if expensive equipment is used is disheartening. If it is true, then we are in serious trouble, for we

> must then conclude that all of our social, ethical, and *political resources have been* exhausted." (B.F. Skinner, 1977)

In conclusion, we must stop long enough to ask ourselves the following questions:

1. Where are we, and what are our needs?
2. What is the overall goal and philosophy in implementing computer assisted instruction? What do we want to accomplish by using the computer?
3. What processes are needed to advance from where we are now to our destination, the end product?
4. Why do we actually want computers?

Do we want computers because Madison Avenue has created a need? Do we want them because its fashionable and have been sold on the idea that they are a quick cure?

In considering the cost-effectiveness we must also answer the following?

> ...For whom is the technology being considered? That is, what is the target population?
>
> Why are we considering this instructional alternative? What purpose will it serve?
>
> When is it appropriate to obtain measures of cost and of effectiveness? Have we allowed enough time for the

full effects of the technique to be explored?

What costs are involved, both for the new technology and for the alternative(s) against which it will be compared?

In dealing with costs, can we account for or measure all the relevant items?

What portion of the educational system costs can legitimately be attributed to the CAI innovation and what to the other alternative(s)?

Do we have conditions conducive to individualized instruction? Will the school and the community accept innovation?" (Seidel, 1980)

..."In a computer-based system, both hardware and software components must be stabilized. Otherwise errors and variability will arise from unreliable equipment, "underbugged" software, and untried components.

The effectiveness of a computer-based educational system can be attributed to its instructional technology components only if the effectiveness measures are used on the portions of that course

> supported by the technology.
>
> Cost-effectiveness of a computer-based system may also be determined from perspectives other than instruction, such as aiding in development of training materials. However, these indices should not substitute for achievement measures if effectiveness of instruction is the primary objective.
>
> Criteria must be fixed for either effectiveness or costs. The evaluator can fix operating costs and assess the system in terms of improved instructional effectiveness, or in terms of the relative costs to attain that level. If both costs and effectiveness levels vary together, you cannot determine the value of any additional benefits." (Seidel, 1980)
>
> "As educators, we must set aside our naive belief that technology will make teachers obsolete and dehumanize the schools. It is just as naive, of course, to believe that technology will solve all our problems." (Cunningham, 1977)

The reason that the computer may not succeed in the educational system and the reason that the computer is not a utopia is that educators have approached the computer in the same manner that they have approached everything else. We have utilized the philosophy that what is good for one is good for all.

> "That the computer can be utilized as an instructional aid in the educational process is apparent. However, to elevate the computer to a paramount status and suggest that it is the "panacea" to cure all educational ills is a falacy in judgment. The instructor is and will always be the essential ingredient. That the instructor inspires, stimulates, challenges, and gives of him/herself in the interaction between student and teacher is a feat that no computer can ever hope to accomplish. Yes, the computer can positively reinforce; yes, the computer can "speak;" and, yes, the computer can even reach the state of mobility. However, the computer cannot think independently of the programmer, neither creatively nor critically; the computer cannot feel; the computer cannot share dreams; and the computer cannot and never will become a human being! (Cowart and Cowart, 1983)

Man's fear of sophisticated machines is predicated upon the notion that humanity is threatened because of limited knowledge. We rely on our senses but what we see is not real. Such emotion makes us skeptical even supersitious. Man does not understand himself. How can he hope to understand a sophisticated machine that does not have emotion?

For the first time, man is at the brink of having limitless knowledge. Even as we talk, it is possible to obtain information about an incident that occurred only an eye-wink ago, anywhere on the face of the Earth. Since man tends to think in a lock step pattern, he has not allowed himself to accept the fact that what has always been done may not be sound practice.

Man is methodical. He's technological and scientific discoveries have brought us to the beginning of a new cosmos. This beginning may not include the abilities and skills that we once thought essential.

The computer has the capability of instantaneously converting from one language to another, any piece of information within its memory bank. We may be at the brink of time when reading and writing as we know them are no longer essential and have become obsolete in their present form. Now we stand at a point where, like Frankenstein's monster, the technology we have created threatens our very lives. The computer controls that monster which would make possible our annihilation, if improperly or unscrupulously used. If man is to survive, he must understand the world around him and he must understand the world within himself.

Although the computer is not a complete solution to all our problems whether educational or otherwise, although the computer is no panacea for all our ills, and although the computer is no utopia, the computer can be utilized as a tool in man's quest for knowledge and understanding about himself and his world.

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THE COMPUTER FORMAT
VERSUS
THE PROGRAMMED FORMAT

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ABSTRACT

The purpose of this study was to compare a computer assisted instruction mode with a programmed text mode for teaching Latin and Greek derivatives to conditionally enrolled university students. The subjects for this investigation, 83 students of Drake University's fall 1983 Transitional Services Program, were randomly assigned to two treatment programs. Each treatment group completed the vocabulary unit using both instructional modes. The content of instruction was identical for these two groups, they differed only in sequence of mode. Student characteristics relating to personality types and learning styles were examined in relationship to both achievement and attitude toward modes of instruction. The data revealed no differences in achievement between the two treatments. There was a significant difference beyond the .01 level in attitude toward CAI, favoring the CAI mode, but this did not result in significantly greater achievement. The results suggested further research regarding these instructional modes as they relate to student characteristics of personality types and learning styles.

Close upon the dawning of the computer age, sometimes referred to as the "fourth revolution in human communication," the computer has found its way into education in the form of computer assisted instruction (CAI) (Shane, 1982). It offers a fascinating potential for learners to achieve skills required for coping in a changing world.

There is ample evidence that people learn from media, yet very little evidence is available concerning which medium can promote the most learning in a given situation (Schramm, 1977).

The present study was concerned with analyzing the relationship between certain student characteristics and achievement through the employment of computer assisted instruction and programmed instruction.

In today's increasingly complex society where the goal of education is the realization of the student's human potential, educators are facilitating student involvement in the learning process as well as assisting them in their development of self-directed inquiry. It has been suggested that the computer may meet the challenge of promoting student interaction with the learning environment (Bork, 1980). More attention should be given to the learner as an individual so that such things as learning style or personality characteristics do not hinder the learner from reaching his/her fullest potential (Mitzel, 1970).

STATEMENT OF THE PROBLEM:

The purpose of this study was to compare the effectiveness of a computer assisted instructional format when compared to a programmed text format in teaching Latin and Greek derivatives to conditionally enrolled university student. Conditionally enrolled refers to those students who have not met the standards of admission because of low college entrance exam scores or low high school grades.

The question that guided the research was: Will the use of a computer assisted instructional format result in a difference in student achievement and attitude when compared to a programmed mode of identical content in terms of certain learning styles and personality variables?

Achievement scores were analyzed to answer these questions:

1. How will performance scores in each instructional mode relate to personality characteristics, learning styles, and preference for a mode of instruction?

2. How well can a prediction be made of which instruction mode would be better suited to individual students?

REVIEW OF RELATED LITERATURE:

The review of research was limited to those studies whose subjects were at least fourteen years of age and many were college students. The studies involved the use of CAI and PI in the teaching of reading. Very little research was found concerning this age group and these instructional modes regarding the role of personality types and learning styles as they relate to reading instruction.

Two studies that involved CAI and PI in the teaching of reading controlled for identical content and used criterion-referenced tests. Both were dissertation studies at Penn State University.

Robert Caldwell's dissertation compared a PI unit with a CAI unit for teaching reading to semi-literate adolescents from Centre County, Pennsylvania. Data was collected on 18 students composing the CAI group; and 38 subjects comprising the PI group. Reading achievement was measured according to pretest and posttest scores. Analysis of this data revealed that subjects did not differ significantly on either test, nor could one mode of instruction be credited with producing greater achievement. Regarding attitude, however, a signficantly positive attitude toward the CAI mode was expressed at the .05 level (Caldwell, 1973).

Patricia Mull's dissertation study involved the comparison of CAI and PI in teaching inservice teachers the Initial Teaching Alphabet (ITA) as well as transliteration of ITA and the traditional alphabet. Subjects were drawn from three graduate reading courses at the university and randomly placed into two treatment groups, those using CAI and those using PI. Treatment I (PI) seemed to achieve more positive effects in teaching the Initial Teaching Alphabet to inservice teachers than Treatment II (CAI). No differences were found, however, in either program in relation to transliteration. Use of the CAI program by Treatment II resulted in a significant positive attitude toward CAI (Mull, 1973).

Two other studies were located that met the criteria for inclusion in this review of research. Both utilized CAI and PI, but identical content is not suggested in one (Bossone and Weiner, 1973) and the other involved both norm-referenced and criterion-referenced tests with differing results (Golub, 1974).

A meta-analysis was made by Kulik, Kulik, and Cohen to provide a synthesis of the reasearch findings investigating computer-based education at the college level. The synthesis was based upon 59 studies classified in these five categories: course completion, instructional time, student achievement, correlation between achievement and aptitude, and student attitudes. According to this study, computer use in college classrooms has made a small but significant contribution to instruction.

The research suggests that in a typical situation involving examination achievement, an average student taught by conventional methods would score at the 50th percentile, while an average student taught by a computer-based system scored at the 60th percentile. High, average, and low aptitude students showed similar correlations (.50) between aptitude and achievement, demonstrating that the difference in achievement shown by students taught by these two methods cannot be attributed to aptitude. Positive attitudes toward instruction and subject matter were exhibited by students using the computer. They seemed to like the course more and show more interest when instruction included the computer (Kulik, Kulik, and Cohen, 1980).

Although there exists a degree of consistency concerning favorable attitudes toward CAI, the whole matter of achievement remains less clear. Usually CAI has been found at least as effective as other forms of instruction, but the studies differ greatly regarding control of content, testing procedures and duration of task. When the characteristics of personality type and learning styles are considered, very little consistency of outcome has been documented.

PROCEDURES:

The total population of 83 students at Drake University's fall 1982 Transitional Services Program were the subjects for the presentation investigation. Students were randomly assigned to two treatment groups. Treatment One learned Latin roots and prefixes by the programmed mode and the Greek portion of the unit by the computer mode. Treatment Two studies the Latin roots and prefixes by the computer mode and the Greek portion of the unit by the programmed mode.

Table I

Description of Subpopulations

	Latin			Greek		
	N PT	N CAI	TOTAL	N PT	N CAI	TOTAL
Treatment One	36				36	
Treatment Two		35		35		
Total			71			71

The main frame computer hardware system at Drake, a VAX/VMS, was used for this instruction with 75 terminals available for student use across campus. The second edition of Programmed College Vocabulary 3600, written by George Feinstein and published by Prentice Hall (1979) was chosen for its content and presentation style. Slight modifications of this text were necessary to accommodate a CAI presentation.

Because the emphasis of this investigation focused upon differences in the medium of delivery, the content of the formats was identical. Both Latin and Greek segments of the vocabulary unit contained fifty roots and prefixes equaling a total of one hundred. Each language contained ten lessons.

Data was collected from six measurement instruments: the Slossom Intelligence Test, the Myers-Briggs Type Indicator, the Learning Styles Inventory, a semantic differential and Latin and Greek pre-posttest. The Slossom Intelligence test, a brief individual intelligence test, was administered prior to the treat ment so that it could be used as a control variable.

The Myers-Briggs Type Indicator was selected to measure personality characteristics. It is designed for grades 9-16 as well as adults and produces four scores: extraversion vs. introversion (EI), sensation vs intuition (SN), thinking vs. feeling (TF), and judgments vs. perception. (JP).

The Learning Styles Inventory is a nine-item self-description questionnaire that yields a comparison of active experimentation to reflective observation and a comparison of concrete experience to abstract conceptualization.

In order to provide a measurement of achievement, two fifty-item pretests were given: one contained Latin derivatives and the other contained Greek derivatives. These criterion referenced tests were followed after treatment by two fifty item posttests that were used to assess gain in these two parts of the vocabulary unit.

FINDINGS:

Complete data was tabulated for 71 participants. There was no significant difference in pretest scores for either Latin or Greek. The mean score on the Latin test was 30 and the mean score on the Greek test was 29. Students did not show greater prior knowledge of one subject than they did of the other.

The data revealed no significant differences in achievement between the two treatments. Students using both CAI and PT did not achieve higher posttest scores in either mode. The mean score for both subject was 40. Students scored as well on the Latin as on the Greek unit and as well with CAI as with PT.

There was a significant difference beyond the .01 level in attitude toward CAI, favoring the CAI presentation, but this did not result in significantly greater achievement. This tended to support the research which indicates that students respond positively to CAI, but do not necessarily achieve more. When compared to more conventional methods of instruction, researchers have reported fewer dropout rates for CAI users than expected. (Caldwell and Rizza, 1979: Penisten, 1981). These positive attitudes appear to endure. While long term users become increasingly aware of problems associated with computer use, i.e. breakdowns and delays, they exhibit little deterioration in their overall favorable attitude. (Magidson, 1978).

Table 2

t-test of Attitude toward CAI and Attitude toward PT

Attitude	Mean	S.D.	DF	t-value
CAI	136.789	23.874	141	8.70**
PT	117.789	23.248		

** @ > .01

Analyzing differences in learning style and personality type did not reveal differences in either achievement or attitude. The Learning Styles Inventory yielded four types of learning styles and the Myers-Briggs Type Indicator revealed four personality types. (c.f. Table 3)

Two facts may reflect importance upon these findings. First, because not all students reach the mastery level on 70% accuracy on posttests, the educational strategies of this vocabulary unit did not serve the needs of all

Table 3

PERSONALITY CHARACTERISTICS

TYPE	DESCRIPTION (Tendencies)	N
Personality 1	Thoughtful, Realist (IS) quiet, observant, guided by inner principles, practical.	13
Personality 2	Thoughtful Innovators (IN) quiet, interested in new ideas, future oriented	12
Personality 3	Action-Oriented Realist (ES) social, practical, doesn't like to sit still long	32
Personality 4	Action-Oriented Innovators (EN) not so practical, interested in new ideas	14

LEARNING STYLE CHARACTERISTICS

TYPE	DESCRIPTION (Tendencies)	N
Learning Style 1	Converger likes to deal with things, have strong technical interests, single correct answer prefered	18
Learning Style 2	Diverger more social emotional & imaginative, interested in generating ideas	18
Learning Style 3	Assimilator like theory, less social than diverger abstract concepts	12
Learning Style 4	Accommodator enjoy activity including new experiences, not opposed to risk-taking,rely upon opinions of others.	23

students. Second, because of their conditional enrollment these students did not have the option of dropping out of this vocabulary unit.

Two conclusions can be made from this research. First, CAI is at least as effective as PI for teaching Latin and Greek derivatives. Second, when both instructional modes are available, student attitudes should be considered in planning learning strategies.

The purpose of this research was not to find a best mode of instruction, but rather to investigate the effectivness of both modes while considering student characteristics. No prediction concerning which instructional mode would be better suited to individual students can be made as a result of this research. While no significant differences regarding attitude or achievement could be attributed to various personality types or learning styles, the concern for individual differences remains one that merits investigation.

REFERENCE NOTE:

For a more detailed discussion of this topic see the dissertation study: Dursky, Janice. "Comparison of a Computer Assisted Instructional Unit and a Programmed Text Format For Teaching Latin and Greek Derivatives to Conditionally Enrolled University Students." Diss. Drake University, 1983.

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A COMPARISON OF TWO METHODS OF INSTRUCTING PREMEDICAL STUDENTS IN STUDY SKILLS

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ABSTRACT

Study skills instruction is increasingly being directed toward specific content areas and research on the relative efficacy of such efforts is contributing toward the development of both the orientation and content of such programs. Dr. Remington reports research comparing a cognitive/affective with a cognitive approach in a study skills program for premedical students using personality factors, reading ability, concept mastery and study skills as dependent variables. The superiority of one approach over the other could not be demonstrated, but analysis of improvement in study skills suggested the superiority of the cognitive/affective method. As a result of this research, Dr. Remington makes eight recommendations for future practice.

This study focused upon the cognitive and affective factors influencing the academic success of premedical students in a Reading and Study Skills Program at Wayne State University during the 1980-81 academic year. The program was set up because premedical students came to the Reading and Study Skills Center seeking better reading and study skills before entering the School of Medicine. A pilot study was set up during the academic year of 1979-80. Two teaching methods were designed, one a cognitive/affective approach and the other a cognitive approach. Reading included a hierarchial set of skills of comprehension, analysis, and synthesis; study skills included time organization, medical notetaking, medical terminology, test taking, memory skills and study techniques in the sciences. Counseling topics included values clarification, self-awareness, assertiveness training, decision-making and interaction with others.

The subjects of this study were sixty-one premedical students, primarily juniors and seniors in the Liberal Arts College and eleven other students who were post graduates or returning adults. The students registered for a section that fit their programs. It was not possible to rework schedules to join a specific section. The distribution was twenty-five students in the cognitive/affective, that is, the experimental group and thirty-six in the cognitive, that is, the control group.

An adequate reading and study skills program is developmental in nature, supplying skills and techniques that typically have not been introduced to students previously. It may be argued that the content is sufficiently valuable to be included as a legitimate part of every college curriculum. Techniques for study and organization are taught. These include: (1) skills for organizing time, (2) skills to develop reading comprehension, (3) skills of analysis and synthesis in reading, (4) skills of notetaking, (5) skills of preparing for and taking of college tests, (6) skills for acquiring a scholarly vocabulary, and (7) skills of study organization. All seven skills may be taught so as to emphasize cognitive aspects of learning. However, non-cognitive or affective variables are increasingly being recognized in reading and study skills programs.

Cognition typically refers to those processes involving thinking, reasoning, problem-solving, and concept learning. The concept of cognition was first explained by Plato and Aristotle through the identification of the three faculties of the mind: cognition or knowing, affect or feeling, and conation or willing. As it is used in modern psychology, cognition refers to that which is known; that is, in reference to an individual, the ideas of the person about himself and his environment.

Piaget points the relationship between affectivity and intellectual functions saying:

> ...there is a close parallel between the development of affectivity and that of the intellectual functions, since these are two indissociable aspects of every action... There is never a purely intellectual action, and numerous emotions, interests, values, impressions of harmony, etc. intervene---for example, in the solving of a mathematical problem. Likewise, there is never a purely affective act, e.g.., love presupposes comprehension.[1]

Piaget also asserts the basic unity of the processes of mental development. He points out that

> Intelligence furnishes affectivity with its means and clarifies its ends... In reality, the most profound tendency of all human activity is progression toward equilibrium. Reason, which expresses the highest forms of equilibrium, reunites intelligence and affectivity.[2]

Unlike Piaget, the social psychologists view attitudes as an aspect of cognitive content. The social psychologists, also known as personality psychologists, seek

> ...to interpret diverse behaviors as due to consistent differences among people... The task of the personality psychologists is to identify within-individual regularities in behavior and between-individual differences.[3]

Freud's psychoanalytic theory and Lewin's theory are concerned with structural concepts of personality. Kelly's personal construct theory in which "behavior is guided by one's personal construct system" is also a structural system.

From these personality theories or affective systems and from what has been identified as cognitive theory, it appears that there are many areas in which both cognitive and affective processes are at work. This is especially true in learning. Ellis explained this interaction as an--

> active role of the human in learning situations, use of strategies, and ways in which the learner might organize materials in order to learn and retain them more efficiently. Since it is difficult to think of any human learning situation in which the human is not in some way actively responding, organizing, and reorganizing the material, human learning always involves cognitive activity.[4]

If one recognizes the human learning process as involving skills in both cognitive and noncognitive areas, then it follows that the fundamental purpose of a college reading and study skills program is the teaching of concentration and logical thought processes as well as skill mastery. Dr. Walter Pauk stated:

> To make progress in any subject or field, you must master, as soon as possible, its basic facts or principles...Mastery converts the ideas and the principles into "magnets". These magnets will then draw the supporting facts and details around themselves naturally, like iron filings...The real reward for mastering our material is that mastery frees us to think with the material. We no longer need to expend our energies to regain it.[5]

It appears therefore that a study skills program for premedical students should include provisions for mastery of the vast bodies of material that they must learn as well as counseling to offset the pressures they inevitably encounter.

The purpose, then, is to compare the effects of two teaching methods in a college reading and study skills program. The method which includes counseling is termed cognitive/affective. The other method is called cognitive, and includes attention to skills development only. Subordinate to this main purpose, but contributing to the whole, the following questions were posed:

1. Is there any change in personality traits of the students, as measured by the California Psychological Inventory in the cognitive/affective treatment which is not present as a result of the cognitive treatment?
2. Is there improvement in the reading scores of the students, as measured by the Nelson-Denny Reading Test, in the cognitive/affective treatment which is not present as a result of the cognitive treatment?
3. Is there a significant difference in the pre and posttest scores on the Terman Concept Mastery Test of students in the cognitive/affective treatment compared to the pre and posttest scores of students in the cognitive treatment?
4. What changes in the Minnesota Study Skills Test occur in the cognitive/affective group that do not occur in the cognitive group?

Research proved that the integration of reading and study skills into existing academic courses was not attempted until recently on college campuses. Students who needed reading and study skills were not considered to be quality students by faculty nor peers. Since students did not express a need for these courses, it remained for researchers to suggest that faulty reading was a source of academic difficulty. Behaviors in the affective domain were also related to academic achievement.

The study in 1973 at Pennsylvania State University appears to have signaled a turning point for reading and study skills classes. The researcher, Mary Keetz, suggested that motivation and personality were related to improvement in reading, study skills and academic achievement.

From the studies of Entwisle and Hebel, Shatin, Ambrosino, Brading and Noval, and Weinstein and Geipple which had investigated poor study skills of students already in medical school, it seemed that new research should analyze the study skills of premedical students and thus attempt to alleviate some of the pressures of the later years of medical school.

The present article highlights new research done on the study skills of premedical students. It reports the following hypotheses for a quasi-experimental design, a non-equivalent control group plan:

1. The students in the cognitive/affective study skills method will

show higher scores in personality improvement than those in the cognitive study skills method.

2. The students who have been in the cognitive/affective study skills method will demonstrate greater improvement in Reading scores of Vocabulary, Comprehension, and Rate than students in the cognitive method.
3. Students in the cognitive/affective study skills method will manifest better scores on the Terman Concept Mastery Test than those in the cognitive study skills method.
4. As demonstrated on the Minnesota Study Habits Test, students in the cognitive/affective study skills method will show greater competency in study skills method.

These hypotheses are stated in null form:

1. There will be no significant difference in personality as measured by the California Psychological Inventory between the cognitive/affective and the cognitive groups.
2. There will be no significant difference in reading ability as measured by the Nelson-Denny Reading Test between the cognitive/ affective and the cognitive group.
3. There will be no significant difference in the cognitive/affective and the cognitive groups.
4. There will be no significant difference in the scores on the Minnesota Study Habits Test between the cognitive/affective and the cognitive groups.

Means and Standard Deviations were first computed for each of the pretest and posttest measures. Analysis of covariance using repeated measures was the statistic used to test the hypotheses proposed. The level of significance was the .05 level. The independent variable was singled out as the teaching method used with each group, and the dependent variables were the California Psychological Test, the Nelson-Denny Reading Test, the Terman Concept Mastery Test, and the Minnesota Study Habits Test. Covariates were the Watson-Glaser Critical Thinking Appraisal, an aptitude test, and the rank of each student. As a result of the experiment, none of the four null hypotheses was accepted. In the cognitive/affective group, students did improve significant in sociability, tolerance, capacity for status, but not in communality. The superiority of one method over the other could not be demonstrated. However, the analysis for improvement in study skills did indicate superiority of the cognitive/affective training method which very nearly approached significance at the .05 level. The ANCOVA presented in the following table will illustrate. The F (1.55)= 20.47 indicates that the improvement in study skills is significant. The F (1.55) = 3.90 for the interaction almost achieved significance, $p<0.053$ level, the cognitive/affective group improving more than the cognitive group. (c.f. Analysis of Covariance: Study Skills (MSHB).

Study Skills were an important goal of this study. Students, especially those in the cognitive/affective group were receptive to learning study skills and viewed them as leading to academic success.

ANALYSIS OF COVARIANCE: STUDY SKILLS (MSHB)

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	Tail Probab.
Type of Training	5.14362	1	5.14362	0.35	0.55
1st Covariate	1.48887	1	1.48887	0.10	0.75
2nd Covariate	0.18114	1	0.18114	0.01	0.75
All Covariates	1.57305	2	0.78652	0.05	0.91
Error	771.01218	53	14.54740		
Pre/Post Test	185.18431	1	185.18431	20.47	0.01
Type Training & Pre/Post Test	35.28957	1	35.28957	3.90	0.053
Error	497.57008	55	9.04673		

Study skills were an important goal of this study. Students, especially those in the cognitive/affective group were receptive to learning study skills and viewed them as leading to academic success and admission to medical school. Time-budgeting and notetaking are critical aspects of successful study habits and these were directly taught. The inter-action of both groups for the study skills problems section of the test which includes time budgeting,test-taking skills, notetaking skills, and basic skills approached significance at the .053 level for both conditions. The fact that both types of training led to a decrease in study skills problems suggests that successful learning contributes to one's ability to cope with stress and anxiety.

Experience gained during the study suggests at least eight recommendations for future practice. They are:

1. Counseling, which involves listening, plays an important role in teaching. Study skills are highly personal and contribute to a person's learning capacity. However, learning does not take place in isolation. Students need the opportunity to interact with an interested teacher-counselor and to profit from personalized dialogue.
2. Teaching should emphasize time organization, notetaking, examination skills, and efficiency in reading textbooks.
3. Credit for a course in reading and study skills, although not certified toward graduation would provide motivation for those who need skill development.
4. Instruction in analysis and synthesis is highly recommended for learning logical thinking.
5. Modules of instruction for such study skills as time-budgeting, notetaking, and examination skills should be made available for students who cannot arrange time in their schedules for a reading improvement course or a study skills course.
6. Cassettes with guided lessons on the academic vocabulary peculiar to each discipline should be assembled.
7. Instruction in word etymology is recommended.
8. Computerized programming where students could proceed at their own pace to work on previously outlined needs is recommended. However, there should always be personalized

follow-up with the student.

The question, "Did the cognitive/affective training produce individuals who would be more successful as medical students and more effective as practitioners?" should be answered by a follow-up study of the same students five years hence.

Another investigation to study the links between language awareness and vocabulary growth is suggested. The investigation should consider such factors as experience and culture.

A new test for adults is needed to measure divergent as well as convergent thinking. A wider sampling of students in most standardized test construction is recommended. More research is needed on the stimulation of vocabulary growth in adults, comparing teaching style and effectiveness of various periods of time in learning to study and read.

FOOTNOTES

[1] Jean Piaget, *Six Psychological Studies* (New York: Random House, 1967). pp. 33, 69-70.

[2] *Ibid*., pp. 69-70.

[3] William A. Scott, Wayne Osgood and Christopher Peterson, *Cognitive Structure: Theory and Measurement of Individual Differences*. (Washington, D.C.: V. H. Winston & Sons, 1979).

[4] Henry C. Ellis, *Fundamentals of Human Learning, Memory and Cognition*, 2nd ed. (Dubuque, Iowa: Wm. C. Brown Publ., 1978), p. 297.

[5] Walter Pauk, *How To Study In College* (Geneva, Ill: Houghton Mifflin Co., 1974), p. 7,8

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THE BASIC "HOW TO'S" FOR VALIDATING A STUDY SKILLS INVENTORY

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ABSTRACT

This project arose from a need to find out just what study skills are utilized by successful students at Franklin University, an urban commuter school whose primary degree program is business. This paper explains the process by which a study skills inventory was validated on that population. Results of the validation indicated that while most of the students utilized a broad range of study skills, they particularly valued their listening/note-taking skill and their careful exam preparation.

What academic reading and learning skills does a student need to know? The answer to this question seems easy to determine. Simply administer a study skills inventory, compare the results with the norm, and then organize a plan to enhance strengths and remediate or minimize weaknesses.

But what can be done when the normative population is significantly different from the student population? Such is the case when the *California Study Method Survey* or the *Survey of Study Habits and Attitudes* -- Brown-Holtzman is used with non-traditional students. Wilson (1967) recommends the California for ages 12-18 and the Brown-Holtzman for ages 14-21. The average age at Franklin University, for example is 26. Besides age, our students are different from traditional college students in lifestyle and family background. Whereas traditional college students tend to focus their lives on school, our students balance work, family, and school responsibilities. Also, most of our students come from families in which parents did not attend college. Finally, most of our students did not follow a college preparatory curriculum. Thus, the differences between the normative and non-traditional student populations may be great enough to call into question the validity of these inventories for non-traditional students. Consequently, we undertook the present project to discover what were the study skills of good students at our institution.

We already had an inventory in hand, one based on objectives of our course, College Reading and Study Skills (CRSS), so the task was simply to validate it. We followed the guidelines suggested by Van Dalen (1966).

First the CRSS inventory was evaluated and revised slightly. The language of the statements was made positive and jargon-free. The 48 statements were adapted to a five-point frequency-of-use scale ranging from "almost always" to "don't know." One open-ended question was included so there might be a way for respondents to reveal study skills not listed on the inventory. Directions were simply worded, and overall the inventory was organized to flow logically from one topic to another. Average completion time was about 20 minutes.

A non-traditional Franklin University population was selected to validate the inventory. That group was selected according to these criteria:

a) 3.3 or better GPA at the end of the fall 1981 term,
b) enrolled in spring 1982 term,
c) completed at least 60 credit hours by the end of the fall 1981 term,
d) bachelor's degree candidates in the College of Business and Public Administration.

From the university data base an alphabetical list of about 300 students was generated; a random selection of 150 students was then made.

Even while selection of the population was proceeding, methods of distributing material and ensuring a good return were being considered. Expense and poor return rate ruled out mailing. Gathering everyone in one place was impossible with a commuter group. Finally, it seemed easiest to distribute materials through colleagues. At Franklin most full-time faculty and often even adjuncts are willing to make announcements and to promote each other's causes. So with a cover letter attached to explain the project and solicit cooperation, bundles of envelopes were prepared for distribution to colleagues who in turn were to give them to the selected students in their classes. Each envelope contained another letter explaining the project and encouraging the student's participation, the inventory, and an answer sheet.

A simple hand tabulation system was organized so that a work-study student could record responses to the statements on the inventory. Plans were made for grouping and counting responses to the open-ended question, despite no one knowing what responses to expect.

Of the 150 sets of materials distributed, 82 (55%) were returned and tabulated. Percentages were calculated for each of the responses for the 48 statements. Responses to the open-ended question were recorded in one of two ways. The open ended-question asked "What is the most important thing a student should know about reading/study skills?" Therefore, many responses were restatements of skills already on the inventory. These were easily sorted and tallied. Other responses which did not match inventory items were put into general categories: text reading, listening/notetaking, memory, exam preparation, time management, classroom behavior, and commitment to school.

Results of the validation project indicated that while the validation group did read textbooks adequately, they considered their thorough and organized class notetaking and follow-up study to be even more significant. They responded both to statements in the inventory and to the open-ended question that self-control was crucial to their success because it enabled them to manage time, stimulate interest in courses, keep up to date, and plan ahead for exams and special projects. These students also indicated strongly that they can select and learn what is important in a course. It was obvious that these students are what we might call "pluggers." They feel education is important, and they focus their energy and time consistently to carry out that commitment. In fact, only 1 of the 82 responded in a matter-of-fact way that learning was no particular challenge because he always "got it the first time."

Besides those skills related to day-to-day coursework, the validation group also professed confidence in their library research and writing skills. Finally, and not surprisingly, the group proved to be readers. In spite of their crowded schedules, most regularly read newspapers, magazines, and books.

Results of the validation have been used in several ways. The project enabled us to answer that nagging question, "What study skills do students need?" We did find out how important are the various study skills to our students. Consequently, we adjusted the topics and assignments within CRSS to provide stronger training in listening/notetaking and exam preparation. Perhaps most interesting of all is the fact that we gained silent partners in our educational enterprise. When we say, "Our good, experienced students wanted to tell you..," we know there is a unique kind of encouragement for our beginning students.

As with any worthwhile research project, the validation spawned other projects. Responses of beginning students in CRSS are now compared to those of the validation group. Also pre-CRSS and post-CRSS shifts on the inventory have been documented. Finally, the inventory was validated with a diploma nursing school population.

Clearly, even those who teach in undergraduate institutions, working with a minimum of university support, can carry out and benefit from research. The opportunities are particularly numerous for those of us who work with non-traditional or unique student populations.

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STUDY SKILLS INVENTORY

To answer accurately, you should search your memory to recall what you actually do, know what you think you should do. The first response that comes to your mind is probably the most nearly accurate one, so keep moving down the list without stopping to ponder too long on each statement.

The sentences state activities which a student might do. You should read a statement and then on your answer sheet mark to what extent you do the activity.

Mark A for almost always
B for frequently
C for occasionally
D for rarely
E for don't know

1. I prepare for textbook reading by surveying and creating questions about the material.
2. I learn the words that are new in each chapter.
3. I read in order to find main ideas of paragraphs and sections of textbooks.
4. After I read a paragraph or section, I say the important points and details to myself.
5. I underline key words or sentences in my textbooks.
6 I write notes in the margin of my textbooks.
7. I make a study guide or outline for those textbook chapters or sections which are especially difficult.
8. Before class I review the notes from the previous session.
9. Before class I pause to think briefly about what might be covered that day.
10. During a lecture I try to record at least the main ideas in my notes.
11. I indent, number, or label my notes so that lecture main ideas and details are clearly separated.
12. After a lecture I reduce the main points to cue words and record them in the margin.
13. After a lecture I recite and review my notes.
14. After a lecture I write a short summary.
15. Each week I review each course, combining textbook, lecture, and supplementary sources.
16. I concentrate on study or reading for about fifty minutes before taking a break.
17. When I sit down to study, I know exactly what must be done.

18. I use varied study materials for reinforcement of a chapter: flash-cards, studying with a friend, etc.
19. I feel good when completing study tasks.
20. I can make myself become interested in something I need to learn.
21. I try to relate new information to previous knowledge.
22. I distribute my memory work over several practice sessions.
23. I recite (say aloud) the ideas I want to remember.
24. Before an exam week my lecture notes and other materials are organized and completed.
25. Each week I compose a few practice exam questions.
26. I get sufficient sleep before an exam.
27. I avoid talking to friends before an exam.
28. I am able to control test anxiety.
29. I prepare differently for essay and objective tests.
30. I read exam directions carefully.
31. I budget my exam time and stick to it.
32. My essay answers are clear and complete.
33. I answer the easiest objective questions first.
34. I analyze returned tests and ask for clarification of comments.
35. I feel that I can select and learn whatever is important in a course I take.
36. I plan my time and set priorities each day.
37. I complete my top priority tasks each day.
38. I use time efficiently.
39. I plan ahead for quizzes, papers,

tests, etc. during the term.

40. By the end of the first week of classes I can figure out what a course will cover.
41. I am able to use the card catalogue in the library to locate books.
42. I know and am able to use a correct form for footnoting.
43. I am able to use periodical indexes in the library in order to locate magazine articles.
44. I know how to write a bibliography for a research report.
45. I am able to take good notes and organize them appropriately for a research report.
46. I read a newspaper.
47. I read a magazine.
48. I read a book.

Turn over the answer sheet and use the lines of Part 3 Completion to write your answer completing this statement: If you're going to be a successful student, the most important thing to learn about reading/study skills is -- Items on which 75% or more of the validation group responded A or B.

2 - 75%
3 - 87%
5 - 79%
10 - 98%
11 - 86%
16 - 76%
17 - 94%
19 - 90%
20 - 83%
21 - 89%
24 - 83%
30 - 98%

32 - 86%
34 - 90%
35 - 89%
37 - 84%
38 - 82%
39 - 83%
41 - 84%
42 - 79%
43 - 78%
44 - 89%
45 - 95%
46 - 78%
47 - 78%

TESTS AND BOOKS USED IN COLLEGE ACADEMIC SKILLS PROGRAMS

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ABSTRACT

This is a report of a survey conducted to determine what tests and books are most often used in the academic skills programs of colleges in the United States. Approximately 320 colleges and universities were contacted resulting in 206 completed questionnaires. The results indicate that the most popular were the Nelson Denny Reading Test and Pauk's *How To Study in College*. There were a great number and variety of tests and books reportedly being used among the schools responding.

The purpose of this study is to facilitate the process of communication between professionals in the reading and study skills area. Such communication may save time in searching for alternate tests and instructional materials and provide new ideas for creative programs. A certain amount of this kind of information is exchanged at professional meetings and in journal articles but can be greatly enhanced through the means of extensively distributed questionnaires. The present paper is based upon the partial results of a survey of two and four year colleges throughout the United States concerning many aspects of their academic skills courses. Reported here are the responses to two of the questionnaire items, specifically the tests and textbooks most frequently used in these basic skills programs.

Method

A twenty item questionnaire was devised to survey materials and practices in college basic skills courses. The two questions that are dealt with in this paper are: 1) What test(s) or diagnostic tools are used for student diagnosis or placement. 2) List the text, manuals, etc. most often used in the courses.

The questionnaire was mailed to colleges and universities throughout all fifty states. Institutions selected for the study included large public and private universities and public and private community colleges. Approximately 300 questionnaires were sent out and the senior author visited an additional twenty schools. From these mailings and visitations a total of 206 (64%) completed questionnaires were received.

The responses were tabulated to determine which were the most frequently used tests and books in academic skills programs.

Results and Discussions

The results indicate that the most frequently used tests in the basic skills programs of the colleges surveyed were:

Percentage	Test
43.3%	Nelson Denny
12.8%	McGraw Hill Basic Skills System
10.3%	A.C.T. or SAT
9.9%	Essay or Writing Sample
8.4%	Mathematics test

There were approximately thirty tests named. In addition to the above, others that were mentioned more than once were: California Achievement Test, College Board Tests, Cooperative Reading Test, Stanford Diagnostic Test, Triggs Diagnostic Reading Test, and various self-developed inventories.

The books mentioned most frequently were:

14.6%	Pauk, W. *How To Study In College*. Houghton Mifflin.
3.9%	McWhorten, K. *College Reading & Study Skills*. Little Brown.
3.4%	Spargo, E. *The Now Student*. Jamestown.
2.9%	Shepard, J.F. *Reading Skills For College Students*. Houghton Mifflin.
2.9%	Jaffe, I.A. *Opportunity For Skillful Reading*. Wadsworth.

A total of approximately sixty book titles were obtained from the survey. Some of those mentioned more than once were:

Adams, W.R. *Developing Reading Versatility*. N.Y.: Holt Rinehart & Winston.
Jacobus, L. *Improving College Reading* N.Y.: Harcourt Brace Javanovich.
Langan. *English Skills*. N.Y.: McGraw Hill.
LeFervere. *Reading Power & Study Skills for College.* N.Y.: Harcourt Brace Javanovich.
Miller, L. *Increasing Reading Efficiency*. N.Y.: Holt, Rinehart & Winston.

Rubin, D. Reading and Learning. N.Y.: Macmillan
Shepard, J.F. RSVP. N.Y.: Houghton Mifflin.

The most obvious fact that is noted from the survey is that there is one test and one book that dominates the field in regard to popularity of usage. The Nelson Denny Reading test is used more than three times as often as any other standardized test and How To Study in College by Pauk is almost four times as popular as any other academic skills book. There seems to be a widespread concensus of opinion on this matter.

The popularity of the Nelson Denny may be due to the fact that the time limit (35 minutes) is shorter than any of the other up-to-date reading tests. It can easily be given in one class period. In addition to vocabulary and comprehension it also measures reading rate while some of the other tests do not. It is also well normed for college level. A survey of elementary and high school programs might give different results.

It is more difficult to determine why Pauk's How To Study in College is so much more popular than other books noted in our survey. One of the reasons might be that it is the only book among the top five that is devoted primarily to study methods. The others emphasize reading skills which is somewhat superfluous if it is used in a program where study methods and reading are taught in seperate courses.

Conclusion

Although this survey shows one test and one book with outstanding popularity in the field, it is still the responsibility of the course instructor or instructors to select the most appropriate test and instructional materials for their particular course and for their students. Since there are a large variety of academic skills courses and great variations in individual differences and needs of students there is bound to remain a great variation in the selection of tests and instructional materials in the colleges.

CURRENT ISSUES IN THE ASSESSMENT OF READING COMPREHENSION

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ABSTRACT

Dr. Rankin is presently engaged in a large scale research and development project using the *Degrees of Reading Power* test in assessing the minimum reading skill of prospective teachers in 21 colleges and universities throughout the Commonwealth of Kentucky. Reasons for using this particular measuring instrument include: (1) the use of an item format which permits the measurement of an information processing construct of reading comprehension, (2) the setting of a meaningful standard for defining minimum reading skill, and (3) the high degree of ecological validity possessed by this instrument. For purposes of the present paper, the above characteristics also provide a framework for discussing these three general issues relative to the measurement of reading and some current misconceptions about these matters held by some practitioners and reading researchers who publish scholarly papers on these topics.

WORD DELETION TESTS IN THE ASSESSMENT OF READING COMPREHENSION

Two general item writing procedures have often been used in reading comprehension tests. One procedure involves asking questions of the reader after he has completed the reading of a passage. The other approach involves imbedding items within the passage itself. Most often, in traditional reading tests, the reader is asked to read a passage and then answer several questions, many of which may not have been in mind at all during the process of extracting information from the page. Such questions generally measure the ability of the reader to solve a variety of cognitive problems based upon the information previously extracted from the passage(s). These kinds of items measure selected "products" of reading rather than "processes" actually involved in the act of reading *per se*. Of course, if a person makes a high score on a "product" reading test, it can be assumed that adequate textual processing has occurred. On the other hand, a low score may reflect deficiencies in processing information and/or producing the product(s) demanded by the test questions. The second type of item usually involves deleting words from a passage and asking the reader to infer from the remaining context the word that the author used in writing the passage. Such items operationally defined a construct of reading in terms of the processes involved in reducing uncertainty while testing hypotheses through a continuous sequence of inferences about what semantic and/or syntactic information is most likely to follow at the surface level of the printed or written line of text. This type of item measures inferential processes involved in extracting information as contrasted with typical objective test items. Methodologically, they have the desirable effect of reducing the unpredictable influences of the art of item writing upon the measurement process. A person with a low score on a "process" test cannot solve problems on textually related questions which presume an understanding of the text. However, a person making a high score on such tests can usually display a superior ability to solve higher level cognitive problems.

The imbedding of blank spaces in textual materials for measuring reading comprehension takes many forms, including incomplete sentences, the deletion of key words, cloze items, and the type of items used in the *Degrees of Reading Power* test. Unlike cloze tests as originally conceived by Taylor (1954), an item in the *DRP* test consists of a sentence with *one* rationally selected blank space followed by five multiple-choice options. Although these two types of tests share much in common, there are important differences both with regard to their method of construction and the uses which can be made of their results. Although they are both essentially measures of the ability to process information from the printed page, the *DRP* test is not to be considered as *simply* a multiple-choice cloze test as indicated by Guthrie (1981).

Despite years of research attesting to the criterion-related validity of cloze tests, in recent years there have been a number of questions raised in the literature about the validity of cloze tests which bring into question the desirability of using such tests in the measurement of reading comprehension. Writers such as MacGinitie (1960), Carroll (1972), Tuinman, Blanton, and Gray (1975), Alderson (1978), and Shanahan, Kamil and Tobin (1982) have carried out studies which purport to show that cloze tests do not measure reading comprehension but rather measure a person's grasp of linguistic clues in the immediate environment of deleted words. Therefore, it is alleged that cloze tests measure language skills which only correlate with tests of reading comprehension, which presumably do measure reading comprehension because they are sensitive to the grasp of broader organizational relationships and higher level abstract thought processes than can be tapped by word deletions.

Regarding the issue of contextual constraints, the DRP test should not be subject to this criticism because it is specifically designed to measure intersentential constraints. However, the issue is not "clozed" regarding the limits of contextual constraints for cloze tests. Indeed, the fundamental importance of this matter in evaluating cloze test validity may well be questioned. Despite evidence produced by the previously mentioned authors in support of the local redundancy hypothesis, other authors such as Marshall (1970), Ramanauskas (1972), Nutter (1974) Funn (1977-1978), Oller and Perkins (1978), and Rankin and Thomas (1980) have produced evidence in support of the contention that clues to cloze items are not sentence bound. Henk (1982) has pointed out several deficiencies in the Shanahan, Kamil and Tobin (1982) study, and Rankin and Thomas (1980) have noted several limitations of the often quoted MacGinitie (1960) paper. A careful examination of all of the research on this question reveals, at best, contradictory findings and conclusions. More basically, however, it seems clear that the assumption that a valid test of reading comprehension must necessarily tap the grasp of broad organizational relationships among widely spaced sections of paragraphs and larger organizational units is based upon a "product" construct of reading comprehension rather than upon an "information processing" construct of reading comprehension. No convincing evidence has been presented to prove that the grasp of relationships among widely separated portions of a printed text must be tapped by tests of "information processing" as contrasted with "product" type reading tests.

One might ask, "In what sense do any reading tests measure comprehension directly and what are the criteria by which one determines that conventional reading tests measure the construct "reading comprehension" while work deletion tests measure something else?" Reading as a construct is a hypothetical trait of the individual that we literally "construct" in order to help us explain or understand more about a person's reading ability. For different theoretical or practical purposes, different reading constructs are generated. It seems unlikely that a set of attributes charcterizing reading would be identical for a second-grade child reading a basal reader story, a vocational high-school student reading a computer program, and a college professor reading Aristotle. Since different reading constructs exist to serve different purposes, different types of tests should operationalize these constructs in a manner which will satisfy the criteria for construct validity.

A construct or trait of reading cannot be observed. Its properites can only be inferred from a series of behaviors which can be agreed upon as a set of minimally necessary attributes which uniquely differentiate one construct of reading comprehension from another.

Reading tests only elicit responses to items. If the test has construct validity, we may infer from the results the degree or amount of the latent trait underlying the reader's discreet responses to test items. If the test has construct validity, we may infer from the results the degree or amount of the latent trait underlying the reader's discreet responses to test items. Since no reading tests measure any reading construct directly and our theoretical grasp of reading constructs is rather limited, it is obvious that word deletion tests as well as conventional standardized tests are, at best, several steps removed from the underlying trait or traits being measured. Responses to all reading tests only correlate with the amount of the hypothesized trait corresponding to a given reading construct. Therefore, evidence that word deletion tests measure something obviously different from conventional tests is not a reasonable basis for concluding that word deletion tests are not measuring reading comprehension but that other types of tests are presumably doing so.

In summary, it is the writer's view that the information processing construct of reading as measured by both cloze tests and the DRP test, is a definable and useful construct of reading comprehension. Inferential cognitive processes measured by these two tests are not merely correlated with reading comprehension; they represent a different construct of comprehension. If information encoded in language is not extracted from the printed page, no higher level cognitive processes using this information will be possible. Reading constructs and tests of these constructs can focus upon reading-language products depending upon the purposes of the investigator. The processing of language from printed texts is not merely an extraneous variable correlated with reading comprehension, as some would have us believe.

SETTING STANDARDS FOR READING COMPETENCY

In the history of testing, the result of classroom tests of an objective nature were typically interpreted in terms of the percentage of questions answered correctly. Of course, the results of such tests reflected some unknown combination of knowledge and/or skill achieved and the difficulty of the questions asked on the examination. Norm-referenced tests were developed in an attempt to measure skill and knowledge by interpreting an individual's score in relation to other individuals. This strategy solved the problem of the effects of question difficulty, because the results were not interpreted in terms of the number or percentage of items answered correctly but in terms of a person's relative position in a distribution of scores. If the questions were difficult, this would have a relatively small effect upon a person's position in a rank order of scores. Unfortunately, standardized norm-referenced tests of reading, while giving us a great deal of useful information about individual differences in reading skill, still fail to measure competency in reading. Although scores may be interpreted in a normative fashion in the form of grade equivalence scores, percentile scores, or a variety of standard scores, the answer to the question of competency or adequacy still eludes us.

In the 1960's, a different approach to this problem in the form of the criterion-referenced test was developed. The ideal of a criterion-referenced test of reading is to measure the ability to either master or fail to master specific reading skill objectives, individually or collectively, in relation to some external standard established independently of the test result. If the external standard constituted a defensible criterion of mastery or competence, then problems associated with norm-referencing and item percentages as standards would be solved. Although in many ways criterion-referenced tests of reading give useful information for classroom and remedial teaching regarding achievement of specific reading skills, problems of selecting the particular reading skills to be measured and establishing an external standard for the number of particular reading skills that should presumably have been mastered, have not been solved. As a result, most criterion-referenced tests have resorted to the use of percentages in interpreting results. Until we know what a hundred percent score means on a test of reading comprehension, we certainly cannot interpret the meaning of any other percentage.

A potentially important solution to the problem of standards in criterion-referenced tests is to construct a domain-referenced test. The ideal of this type of a test is to produce a test consisting of an actual representative sample of items from a well defined population of tasks. Such a test would permit an estimation of an individual's "domain status" (i.e., the proportion of tasks in the domain to which he is capable of responding correctly). However, in order to construct a reading test of this nature, we need specific item writing specification so designed as to permit different item writers working independently to construct an identical set of items to measure a specified number of objectives. Thus, a large sample of items could be produced from which a representative sample could be drawn. If this could be done, the percentage of items answered correctly in the sample could be generalized to the domain of reading comprehension. This approach is still more in the realm of theory than of practice, and in the meantime neither the use of percentage scores or normative scores provide us with an adequate solution to the problem of setting standards in reading.

In the writer's judgment, the Degrees of Reading Power test is a model of a unique and practical strategy for setting a standard for reading competency independently of the test results. The DRP test expresses scores on the same metric as the measurement of readability. This constitutes a testing system which permits the interpretation of a test score in terms of the most difficult nontechnical prose material that a person can read with comprehension. The use of the same unit of measurement for both test scores and readability estimates overcomes inherent difficulties involved in trying to match up norm-referenced grade-equivalent scores with grade level readability scores. By regressing DRP test scores on the Bormuth mean cloze formula which expresses passage difficulty in terms of the percentage of close items a heterogeneous group of readers would answer correctly upon a test based upon a particular passage, traditional problems of grade level interpretation have been avoided.

If a reader obtains a DRP score of 65, for example, he should be able to process information in non-technical expository prose for materials which have a DRP difficulty of 65 or less but would have difficulty understanding material with DRP values of more than that amount. By the same token, if the average degree of difficulty in DRP units for materials which students are expected to read in, for example, college texts were about 70, then readers with DRP scores of less than 70 would have problems coping with the demands of their reading assignments. This technique for establishing minimum standards of competence constitues a signficant advance in the art and science of testing.

ECOLOGICAL VALIDITY OF READING TESTS

As a member of a symposium at an annual meeting of the International Reading Association, the writer was present when a discussion of "Ecological Validity" of reading tests was conducted. This proved to be a highly popular concept, due in part to the current interest in "ecology" and related social movements and to the immediate appeal of administering tests whose results relate to the real world of literacy demands. A reading test may be said to be ecologically valid to the extent that people who pass the test are more effective in meeting the literacy demands of the real world than are students who fail the test. (Guthrie, 1981). Unfortunately, the members of the audience at this meeting leaped to the conclusion that all that was demanded of a reading test was to have items which paralleled the types of materials that people read outside of school such as directions, advertisements, forms, etc. Any attempt to discuss the importance of reliability or types of validity in reading test construction was dismissed by an audience of public school teachers who were both psychometrically and edumetrically uneducated.

Some cautions are in order in evaluating the ecological validity of reading tests. In research, an inverse relationship may exist between degree of experimental control and the degree to which results can be generalized to natural settings. In experimental designs, "internal validity" asks, "Did in fact the experimental treatment make a difference in this specific instance?" "External validity" asks, "To what populations, settings, treatment variables, and measurement variables can this effect be generalized?" (Campbell and Stanley, 1963) Now it is axiomatic that internal validity must be reasonably high before there can be any results to generalize (i.e., external validity of ecological validity). Similarly, in the measurement of reading, technical criteria for high test reliability and low measurement error must be met before there can be any possibility of generalizing results to the real world of reading either inside or outside of schools. These prerequisites cannot be disregarded just because the test contains reality based items. Although all of this is axiomatic to test developers and researchers, it may not be so obvious to others.

Guthrie's (1981) views on ecological validity lead him to question the use of the DRP test. He assigns the highest priority for ecological validity in a competency based reading test for high school students to the criterion, "... that it contain items that are typically found in the environment of adults." Guthrie states that a second criterion for items on a valid competency based reading test at the high school level is whether the test requires an appropriate response from the student - that is, a response similar to that which would be made in the real world.

The present writer believes that the essential criterion for ecological validity of reading test results is generalizability to an appropriate setting; not necessarily "similarity of test content." To assert that item similarity is the essential criterion for ecological validity is to confuse means and ends. Under certain circumstances, item similarity might well contribute to generalizability to the world outside of the testing situation. Under other circumstances, item similarity might be a detriment rather than an asset in generalizing results. For example, since short tests tend to be unreliable, it may be difficult to construct reliable tests measuring comprehension of brief descriptions, application forms, directions, etc. If tests based upon such materials do not provide consistent results on retesting, there is no way that we can generalize the results to settings outside the testing situation no matter what kind of items the test contains.

If an ecologically valid test really requires items which elicit responses similar to those in the real world, the writer presumes that an appropriate response to directions on building a bird cage or how to write a resume might consist of actually building the cage or writing the resume. But these results would confound reading, psychomotor skills, and writing variables. Using such environmentally appropriate responses, what conclusions could be drawn from a student's inadequate test score with respect to his/her reading ability if the bird cage was not well constructed or the resume was poorly written? We could only assume adequate reading had occurred if the test scores were high.

If item similarity between reading test and environmental demands is the sine qua non of ecological validity, any test which is ecologically valid would be measuring behavior in all of its full complexity, involving the same type of motivations, perceptions, and complex environmental features as the real world setting. Such a test might permit generalization of test results of total behavior to other realistic settings, but it would hardly permit any measurement of individual components or segments of this total behavior pattern in relation to specific stimuli, such as reading words. In fact, such an ecologically valid test might well be no test at all reading as separate from other components of behavior. It should be obvious that this concept of ecological validity, if carried to an extreme, contains the seeds of its own destruction.

Any test must necessarily be somewhat artificial to be a test at all. As in research design of experiments, generalizability of test results to appropriate settings is the real test of ecological validity.

An important and highly desirable feature of the DRP test is that it gets results which tell us the most difficult non-technical prose materials that a person is capable of reading with understanding in the real world. Although readability formula results only give us a general index of reading difficulty, one of their strong points is that the measurement of reading difficulty with a formula can be generalized to a variety of different materials. It is of course true, that individuals with a strong background of specialization in a particular topic will interact differently with materials on that topic than other materials with which they are less knowledgeable. Nevertheless, it is the generalizability of readability formula results which gives them their validity and utility in a statistical sense. The use of a wide variety of topics for DRP passages also facilitates the generalizability of results.

This being the case, it becomes possible to devise defacto standards for reading competence by determining the average readability of materials which a designated group of readers should be expected to read such as high school seniors, or prospective teachers. To the extent that a readability formula may be applied to any kind of expository prose passages, results from the DRP test may be generalized to the reading of such materials of a diverse nature. Although it is true that one does not often come across reading passages in books and magazines with deleted words, nevertheless it is the capability of the DRP test to produce results which are generalizable to other materials which do not contain deleted words that is cruicial to its ecological validity. Preliminary studied by Koslin et al (1983) indicate that the DRP test results are predictive of the difficulty of materials that readers are able to read with understanding in the real world. Other studies will no doubt be carried out on this important issue.

In summary, the writer believes that there has been some considerable confusion about these three issues in the assessment of reading comprehension. The failure to recognize the nature of psychological constructs has led to some misconceptions about the validity of some types of reading tests. Techniques for setting standards have not been successful in defining competence or effectiveness of reading. Current enthusiasm for ecological validity as an important requirement for reading tests has led to views of testing which do not advance the cause of good assessment. In the writer's judgment, the Degrees of Reading Test is a superior measure of a useful "process" construct of reading which is both important in its own right and a necessary condition for applying cognitive problem solving skills to the information that has been processed. The novel manner in which this test has been constructed should provide a model for setting reasonable reality based standards for reading and yielding results that are generalizable to the real world of reading.

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SCIENTIFIC VERSUS HUMANISTIC APPROACHES TO READING

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ABSTRACT

This paper attempts to explain the need for a balanced approach between scientific means and humanistic concerns when dealing with students who have reading problems. Reading specialists have considerable technical means at their disposal to help solve reading problems, and these means must always be adjusted to accommodate individual students. Humanistic concerns and associated questions relating to purpose are as important as technical and procedural questions.

Science or the scientific approach has traditionally emphasized organization and measurement whereby individuals observe, measure, and classify. This application of scientific knowledge has resulted in the development of technology, an applied science. The word technology is from the Greek technologia, and it means a systematic treatment. Technology embodies physically what science has already done.

Our new science is in its essence technological.[1] Jose' Ortega y Gasset said, ". . .technology in the fullness of its maturity begins around 1600, when man in the course of his theoretical thinking about the world comes to regard it as a machine."[2] As this was happening humanistic concerns regarding individual worth, independence, creative initiatives, individual potential, and human control with technology became most significant topics for discussion. While technology became extremely powerful there was reflection and fear that unique human characteristics might be suppressed or denigated.

It is not difficult to demonstrate that modern technology is quite dangerous and at times exceeds the ability of human to control it. On January 13, 1982 at 3:45 P.M. in a blinding snow storm, a Boeing 737 Air Florida, Flight 90 lifted off from National Airport in Washington, D.C. bound for Tampa. After clearing the runway, Flight 90 crashed into the 14th Street Bridge during rush hour traffic and plunged into the Potomac River (78 people were killed). About a half hour later and one mile east, Washington's Metro subway system had the first fatal accident in its six years of operation. Three persons were killed and 18 injured seriously in an underground derailment. Five days later on January 18, 1982 at 10:00 A.M., four Air Force precision pilots flying T-38 jets flew into the ground near Nellis Air Force Base, Nevada while practicing a loop maneuver. They were some of the best pilots the Air Force had and were part of the Thunderbirds demonstration team. Five days later on January 23, 1982 a Wolrd Airways DC-10, Flight 30 with 190 passengers aboard skidded off the runway at Logan International Airport and slid into the shallow water of Boston Harbor. Three days later two missing passengers were finally declared unaccounted for and ultimately declared dead by drowning. Twenty-two days later on February 15, 1982 the world's largest semisubmersible oil rig, the Ocean Ranger, thought to be unsinkable sank off the coast of Newfoundland in a storm (84 men were killed).

These tragic events occurring within 33 days were due in most part to human error. It demonstrates that a slight error with high technology can have disastrous consequences. Our technical efficiency can be a powerful opiate to disarm us of some natural concerns. It has been said that our extraordinary progress with technology has taught us how to become gods before we learned to be human.[3]

Within the specific area of reading and the more general area of developmental study skills, human error by teachers is critical but not immediately obvious. Indeed, teachers may never know if they have made an error or not. They frequently must follow their instincts while in a particular remedial situation rather than acknowledge and accept what the test data predicts or prescribes.

Introduction

Reading as a skill to be taught, along with the new behavioral science of psychology, flourished in the first 40 years of the twentieth century. Numbers and various systematic approaches were used to help represent abstract human characteristics and organize data findings. With regard to reading ability, intricate concepts such as comprehension and flexibility were developed, analyzed, and studied. In an organized manner, educators attempted to use scientific methods by developing theory and testing their ideas on students.

Curriculum research or the *process* of reading was conducted along with theory-based research looking for *outcomes* from a particular method. The word "efficient" frequently appeared in the early reading literature along with suggestions for increasing reading rate. There seemed to be an infatuation with the term "efficient reader." Designated efficient readers had mastered certain reading techniques, but this did not make them wiser, more perceptive or more insightful than less efficient readers. Devices for measuring reading efficiency were developed--the tachistoscope, the reading accelerator, the shadowscope, and the metronscope. Organized efforts to improve reading skills were started. One of the first college reading centers was established at Darmouth in 1928.[4] Into the 1940's and 50's considerable effort was made to study eye movements, improve and develop testing procedures, and develop methods or approaches for college level study, such as Francis P. Robinson's SQ3R method.

As a result of the Russians being able to launch the first orbiting space vehicle on October 4, 1957, there was considerable activity within higher education to become more scientific and efficient. In the 1960's it was quite popular to adopt notions of systems theory for educational activity. Systems theory was first used during World War II with such new high technology devices as radar. Donald E.P. Smith has made reference to instructional system technology (IST) with reading and said it refers to behavioral engineering, that is, to arranging environmental events in order to produce reliable, given behaviors.[5] Using something called High Intensity Learning Systems, S. Alan Cohen in a brash, confident way said, "Designing curriculum is an engineering problem."[6]

There is considerable controversy regarding the use of behavioral engineering; even mentioning the term can generate controversy in some quarters. Humanistic misgivings with behavioral engineering have to do with control and manipulation in the hands of imperfect beings. If a skilled jet pilot can make a slight mistake with high technology and kill many people, it is reasonable to assume that a serious mistake can be made by a well-intentioned, experienced educator using methods of behavioral engineering. B.F. Skinner has been acknowledged as a popular and aggressive spolkesman for behavioral engineering, but he has many critics. William Barrett in a cold disdainful way said Skinner "...is particularly persuasive for the simple-minded and half-educated whose members constantly increase in our society."[7]

Scientific Approaches

The scientific approach with humans is usually subject to many variables (human and environmental characteristics) that are difficult to control. Reading behavior and reading disability are two of the most researched topics in education and psychology, yet reading research continues to abound with contradictions and controversies.[8] It is known that standardized reading tests are rather vulnerable to the effects of interest and previous experience when attempting to measure comprehension.[9]

The results of standardized and informal assessment could well be influenced by students' interest in the passages that are used.[10] The lack of agreement as to what functional literacy is (or what should be measured) has resulted in illiteracy estimates ranging from one to 20 percent of the popularion.[11]

Scientists often have difficulty getting a consensus regarding their methodology and results. Walter Lippmann in a half-joking way said, "Science is the occupation of absent-minded professors, of difficult and unsocialbe persons, wise enought, no doubt, but not altogether in their right minds."[12] William Carlos Williams once referred to science and philosophy as little more than fetishes of unspeakable abhorrence.[13] However, with the help of scientists many fraudulent practices within reading programs are exposed. Exaggerated claims for speed reading is a good example. Eleanor J. Gibson and Harry Levin identify research that indicates very rapid reading does lead to loss of factual details, and as a result, a loss of ability to draw inferences from them.[14]

Walter Pauk is quite specific and adamant when discussing students and their reading rate: "At 500 words per minute, they were not reading; rather, they were skipping and skimming and moving their eyeballs, but not their minds, over the lines of print."[15] Bright students are sometimes taught to speed read so that they may keep up with the pack like jackals devouring words. Speed reading techniques seem to have lost considerable support from reading professionals. Last year the International Reading Association's program listed 400-500 presentations with about 2000 presenters, and no one championed speed reading.[16]

New high technology devices such as word processors, programmed television, and microcomputers are now being proclaimed as innovations for reading specialists and other developmental programs. Reading programs on many campuses are using these devices or investigating the possibility of using them. Computer assisted instruction (CAI) modules have been developed to improve reading comprehension at the post-secondary level.[17] These types of modules are used to supplement classroom experience.

George E. Mason and Jay S. Blanchard have an excellent monograph titled "Computer Applications in Reading."[18] They review the history and use of computers and describe some applications for reading instructors (comprehension, critical reading, drill and practice). With a dependence on visual effects, Mason and Blanchard wonder if computers are helping or hindering?

Many users have been found for computers beyond a supplement for instructional technique. Microcomputers are used to crank out readability formulas.[19] Word processors and computers have been programmed to handle great quantities of test data and provide suggestions for remedial work. These techniques may be helpful to busy instructors, but they subtly imply that machines may be more knowledgeable or more in control than a classroom teacher. William

Barrett warns that, "If we try to flee from our human condition into the computer, we only meet ourselves there. The inevitable game of 'choice and consequences' is still to be played out, though on a different level."[20]

Martha Maxwell has said that students must be taught how to think critically about complex problems, to weight evidence, to use logical processes, and to solve problems.[21] With the inertia of technical efficiency there is the hidden danger that process or technique can overtake purpose. Learning a reading technique may be more important for a technologist than understanding what is read. A slavish application to technical exercises can be limiting and debilitating. The technical dimension must always play a supporting role to the classroom teacher and the dynamics of critical discourse. Humans produce the facts for machines to handle, but the facts themselves are changed by conceptual revolutions.[22]

Humanistic Approaches

During the first 40 years of this century, education's eloquent but controversial voice for humanistic approach was John Dewey. He consistently emphasized that the classroom teacher must be sensitive to individual differences and human potential. With a philosophical bent, Dewey said, "Education is a mode of life, of action. As an act it is wider than science."[23] At times he was rather vague but also compelling:

> The sources of educational science are any portions of ascertained knowledge that

> enter into the heart, head and hands of educators, and which by enetering in, render the performance of the education function more enlightened, more humane, more truly educational than it was before. But there is no way to discover what is "more truly educational" except by the continuation of the educational act itself. The discovery is never made; it is always making.[24]

The influence of John Dewey was waning in the 1960's and into the 70's when educators followed their political instincts and accepted government money to advance science. Many humanistic educational researchers specializing in reading were influenced by the psychoanalytic approach that required an analyst or teacher to be able to see the world through the eyes of his patient or student. Bruno Bettelheim and Karen Zelan have attempted to explain the psychoanalytic process with emphasis on the intricate student-teacher relationship. When working with children, they said, "What matters is that the child be given the conviction that he will learn to read..."[25] This has to do with the important concept of self-confidence being transmitted and reinforced by the teacher.

Knowing how to read in a technical sense does not prevent reading problems (e.g., problems relating to anxiety or lack of self-confidence).[26] A reading problem, when identified through testing, does not explain why the problem occurred and what should be done about it.

Teachers, representing the human element, must solve these problems; they are the key to a successful remedial program.[27]

Experienced reading teachers understand that it is most helpful to take students into a sort of partnership and gain their trust in order to determine what the problem is and how to correct it.[28] Reading skills can be improved and self-confidence is enhanced. Those who cannot read at a minimal level are usually hindered by physiological and psychological handicaps.[29] Correcting these problems can be a painfully slow process requiring a lot of student-teacher interaction.

The humanistic places considerable emphasis on human dignity and is usually willing to make a genuine effort for students to overcome severe handicaps. When Anna Mansfield Sullivan took the responsibility of teaching Helen Keller, who was deprived of sight and hearing, she had no way of knowing what potential Helen Keller had. It was done out of love, dedication, and compassion. The remarkable Helen Keller story is repeated in different ways and on different scales by classroom teachers who are able to beat the prediction formula cranked out by machines.

Humans are needed to take on the difficult tasks of overcoming educational handicaps and developing qualities of understanding and reasoning. This job may be aided by technology, but there is no indication that technology can control itself. Technical achievements always bring with them many undersirable side effects.

In the Soviet Union there is less emphasis placed on human worth and dignity than in this country. Educational and industrial training efforts in Russia are highly advanced in the area of technology. It has been reported that Russia is further advanced than any other western country in the use of educational technology.[30] This may be an indication that Russia does not want to develop critical thinkers. Machine smart, programmed technologists are easier to control and less likely to question the state's authority.

Summary

Contrasts between a scientific or technical approach and a humanistic approach are vivid. Electromechanical devices and other technical equipement are efficient, fast, capable of handling large amounts of data, but somewhat limited. Human characteristics stem from the soul or spirit, and they are embodied in such specific traits as compassion, self-denial, insightful behavior, creative impulses, flexibility, a sense of moral value, and ability to set expectations for others. Technology tends to fragment or compartmentalize knowledge and skills while stressing a depth of knowledge. Humanistic approaches usually cut through technical barriers, when it is possible, and seek to achieve a broad integrated perspective for the individual.

We must be extremely careful with the technical knowledge we have developed. "To be an engineer and nothing but an engineer means to be potentially everything and actually nothing."[31] As an example, Vanneavar Bush, the initial

Chairman of the National Defesne Research Committee during World War II published a book in 1946 titled Endless Horizons giving an extremely optimistic view of atomic power. He said, "The atom should be at useful constructive work for us within ten years."[32] Twenty-one years later Bush published another book titled Science Is Not Enough, and he emphasized that humans must be concerned with the welfare of others.[33] This shift from "endless horizons" with science to "science is not enough" represents to some degree caution and concern by an eminent scientist. It has been said that, "The aim of life is to structure an architecture within the soul."[34] For many technologists, the aim of life is to structure an architecture around the soul.

Reading specialists must be humanistic in approach with a scientific understanding and indoctrination to research and applied clinical methods. It is only through an intense study and examination of technical methods that we come to understand their uses and limitations. In a somewhat balanced and harmonious way, scientific and humanistic concerns must come together in the reading laboratory to promote reason, understanding, and self-respect.

Notes

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20. Barrett, Illusion of Technique. p. 101.

21. Martha Maxwell, "Readability: Have We Gone Too Far?" *Journal of Reading*, 21(6) pp. 525-30, March 1978.

22. Hubert L. Dreyfus, *What Computers Can't Do: The Limits of Artificial Intelligence* (New York: Harper Colophon Books, 1979).

23. John Dewey, *The Sources Of A Science of Education* (New York: Liveright, 1929), p. 75.

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26. Herbert Kohl, *Reading, How To* (New York: E.P. Dutton and Company, 1973).

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A TOPICAL CONCORDANCE OF SELECTED STUDY SKILLS TEXTS

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Introduction

The demands of college level studies come as something of a shock to numerous students who have passed their secondary years in a less demanding academic environment or who have managed to meet the academic demands of high school only with some difficulty. Consequently, considerable pressure has been placed on colleges to provide some type of support program to assist such students in developing more mature, independent learning habits and attitudes.

A variety of study skills texts have been written to meet this need and while they generally have a certain common content, they do differ considerably both in the range of topics included and the depth to which these are discussed. This concordance provides an analysis of the relative strengths and weaknesses of some of these texts as an aid to teachers engaged in teaching study skills courses.

Obviously, the authors of these texts face many serious problems: space limitations, unrealistic student expectations, the reading deficiencies of the target population, a reluctance to admit to the need for such assistance, and the immensely complex nature of learning itself.

It is not surprising, therefore, that a number of criticisms can be leveled at almost any text written. The comments made in this discussion are not intended to be negative but to alert teachers to the compensations they may have to make if they elect to use a given text.

One primary limitation of any study skills text centers on the fact that it will always be incomplete to some degree in the sense that it cannot cover all the learning problems students will encounter and it is difficult to provide enough realistic practice of the skills taught to ensure that they will transfer to actual course work.

The practical orientation of the author's of these texts increase the likelihood that they will fail to organize their study techniques and recommendations to correspond to a comprehensive understanding or model learning theory. This inevitably affects their attempts at remediation. For example, some authors attempt to interest students by including illustration or using layouts which appear juvenile or it cross purposes with the serious nature of the topic they are discussing or the complex needs of the student users.

At times this proclevity for practicality inclines these texts to offer simplistic, cookbook, or recipe-like solutions to complex learning problems. They may fail to give the adequate attention to the fact that learning is highly personal and individualistic and is determined as much by personality and background as by talent, purpose, and technique. They may also fail to encourage students to improve on the techniques they are already using by providing new approaches which may or may not relate well to the present situation or the circumstances of the student or the student's past experience. The consequence is a lack of flexibility in the use of otherwise intelligent and effective procedures.

This concordance is divided into two parts. Part I presents a very brief and subjective listing of relative strengths and weaknesses for each text included in the concordance. Such opinions are offered with considerable hesitation, but as objectively as possible. The desire to make available to teachers and students alike the best that the profession has to offer in this important area requires taking a position of some sort in order to draw attention to specific aspects of the materials in question. The writer hopes that those who use the material will form their own judgments regarding the merits or deficiencies of these various texts using the observations made here only as points of departure.

Part II provides a content analysis of a number of texts in tabular form. Topics which students or teachers might wish to review have been organized into an outline which appears on the left-hand side of the table. The texts analyzed have been coded and assigned columns. By reading the column below a given text, one can quickly determine whether that text contains material relevant to any particular topic. One can then refer to the index or table of contents of the textbook in order to locate the information desired. All texts included have been organized in alphabetical order by author.

EVALUATIONS OF TEXTS INCLUDED IN THE CONCORDANCE:

Adams, W. Royce, Jr. and Carman, R.A. STUDY SKILLS: A STUDENT'S GUIDE FOR SURVIVAL (SSG), John Wiley & Sons, New York, 1972

A. Strengths:
   1. The text is written in programmed format and can be used effectively by students outside of the regular classrooms.
   2. Topics discussed are presented in a reasonable sequence, but they can be read profitably in any order because each is a relatively self-contained presentation.
   3. Goals and objectives are given for each unit of instruction and the material contained is effective in meeting those goals.
   4. The exercises for organizing information are good and should transfer well to real situations.
   5. The occasional boxing of tips on different topics is effective and provides a convenient opportunity for quick review.
   6. Chapter 4, Textbook Reading, is perhaps the best chapter in the book. It is limited in scope but is a fine, well organized presentation.
   7. The glossary of college terminology found at the end of the manual is useful and not often provided in texts of this sort.
   8. An index is provided.

B. Weaknesses:

1. The topics, generally speaking, are broad in nature and contain a variety of information which is not easily located for quick reviews.
2. The program format does not encourage a student to do selective reading unless the student has carefully read the table of contents.
3. Because of its format, the book is not useful as a quick reference manual by most students.
4. It would be helpful if the text provided some sort of summary statement at the end of each unit. The boxed-in information is not nearly complete.
5. The chapter on textbook reading is good but quite general and students may not be able to transfer it easily to specific subject matter areas.
6. There are no application exercises.
7. No bibliography is provided.

C. General Impression:

The Carman and Adams book is a very useful text because students can be referred to it for independent work when they aren't able to attend classes or when their needs are general in nature and covered by a particular topic included in the text. The book does not lend itself to classroom use too easily, but that is not necessarily bad since students should become independent learners anyway. Probably a certain proportion of the students would not find this text format appealing and would not persevere in reading long enough to develop the skills it envisions. The book is well written and effective for most college level students.

Apps, Jerold, W., STUDY SKILLS FOR THOSE ADULTS RETURNING TO SCHOOL (SSA), McGraw Hill, New York, 1978

A. Strengths:
   1. The topics discussed are arranged in an effective sequence and are relatively independent of one another. This feature makes the text quite useful as a reference book.
   2. The format of the book is suitably attractive to adults and the use of headings and other organizational aids are effective. An especially effective device is the use of large page numbers accompanied by short chapter titles at the bottom of each page. This greatly facilitates the location of information.
   3. Each chapter contains a summary and a fine list of suggested readings and references. The bibliography is a particularly useful guide for teachers because most of the standard references in the field of adult education are included.
   4. Chapter 3, Improve Your Reading Ability, and Chapter 5, Improve Your Thinking Ability, are among the book's better chapters. However, all chapters are well organized, clearly presented, and adequately comprehensive.
   5. Chapter 8, Addressing the Graduate Student, is a unique feature. It is a useful addition and especially appropriate for the returning adult.
   6. This book contains an index, a feature not common in this type of book.

7. Chapter 1 provides a special insight into the world of the adult, a topic not often discussed in study skills texts. It is well done, realistic and practical.

B. Weaknesses:

1. While the topics discussed in this text are comparatively complete, application exercises are not provided. The student may not effectively transfer what is being taught without them.
2. The applications of suggestions to individual subject matter areas is left to the reader without any discussion of the special problems which are presented by individual subject matter areas. The student may not be able to apply general information to particular subject matter areas without more specific guidance.
3. Specific learning objectives or goals are not provided for each chapter. For students having difficulty in reading and organizing information, this represents a major deficiency.
4. The table of contents is not detailed enough to suggest the many unique types of information the text actually contains. Merely looking at the table of contents one gets the impression of a very prosaic and ordinary text. Actually it contains a number of very excellent suggestions which should be very useful to students.
5. Apps' treatment of Test Taking Skills is not nearly as strong as his treatment of other topics. Considering its importance, more

space should have been devoted to the topic of test taking skills. The author deals with test anxiety but fails to suggest test taking strategies and techniques which could go far toward the reduction of that anxiety.

C. General Impression:
The Apps book is designed for the returning adult student whose needs and orientation are somewhat different from the adolescent's, the audience for whom most study skills manuals are designed.

This book is a good text and well suited to the adult student. It does not provide specific activities for applying many of its excellent suggestions, nor does it provide learning objectives. Both of these would make the text more effective for an independent learner. Chapter bibliographies make the book attractive to the teacher and serious student.

Fenker, Richard and Mullins, Reverdy, STOP STUDYING START LEARNING (SSS), Tangram Press, Ft. Worth, Texas, 1981

A. Strengths:
1. This book is written in an engaging, casual style designed to capture the young reader's attention and interest. It should succeed with a certain type of student quite well.
2. The necessarily didactic character of the material is interrupted frequently by humorous remarks and devices eliciting personal involvement and identification. This is facilitated by use of fictional

characters.

3. The length of the book is not intimidating.
4. A rather conscious effort has been made to attract and hold the reader's attention by means of cartoon figures.
5. The information contained in the different chapters is useful and practical.
6. The book treats the subject of distraction quite well. It is unique in discussing sports learning, language or comprehension, and visual thinking.

B. Weaknesses:

1. The title and art work give the book a somewhat facetious air or quality which detracts from its serious purpose.
2. The personal quality and emotional appeal of the book tend to mask the objectivity of its content. The presentation flows more like a counseling session than a formally organized attack on serious problems. The goal seems to be to persuade more than inform.
3. No objectives are given for the chapters and the reader might well be entertained rather than enlightened by the prose as a result. The presentation need not be boring or dry to be effective, but neither should the reader's attention be distracted by frequent humorous asides and digressions.
4. The two-brain discussion found early in the book may not be based on solid empirical evidence, yet it is presented as scientific fact.

5. The book does not cover many of the nuts and bolts problems facing college learners. It appears in stress mental states or attitudes which are obviously important but not totally sufficient for the improvement of learning strategies which are also skill related.
6. No application exercises are provided.
7. No bibliography or index is provided.

C. General Impression:
While interesting, well written, and useful, the Fenker text is really not directed to the skill development aspects of learning the way most study skills texts are. It should be evaluated in terms of its primarily counseling orientation. In that respect, the book makes a worthy contribution to the literature.

Experience suggests that attitudes will change if skills improve. Fenker tends to the position that when attitudes change, skills can improve. Possibly there is some merit in both positions and it is the question of individual need rather than theoretical orientation which should determine which emphasis should be used in a given situation.

Maiorana, Victor P., HOW TO LEARN AND STUDY IN COLLEGE (HIL), Prentice Hall, Englewood Cliffs, N.J., 1980

A. Strengths:
1. The book is well organized. The discussion sequence is logical, useful, and orderly and is effect-

ive in developing a clear understanding of what the book expects to achieve.

2. Various self quizzes included in the different chapters are quite effective devices for focusing the reader's attention on personal needs. They serve effectively as motivation and clarify learning goals both of which are essential for an effective learning experience.
3. A list of basic ideas and key points are provided with each chapter. The major sections of the book are preceded by an excellent set of learning objectives and chapter previews. These are very valuable aids to organizing or focusing the reader's thoughts prior to reading.
4. The format, typography, and visual aids included in the text are all effective.
5. The review and application questions following each chapter are designed for effective transfer of what has been learned.
6. The information provided under the different topics is comprehensive, clearly presented, well organized, practical, and carefully related to specific behaviors through well-designed activities.
7. Chapter 7 on Thinking Skills and 13 on Speaking Skills are perhaps the most noteworthy chapters in the book. Chapter 17, How to Study creatively is also commendable and unique.
8. The appendix on Choosing A Curriculum supplies a major need in most study skills books. Surprisingly,

this topic is seldom treated in this type of manual.

9. The book has a very useful index.
10. Rather than cater to the immaturity and superficiality of many students needing assistance in their study skills, the book raises the student to the serious level of competence and industry that is required for effective study.

B. Weaknesses:

1. Students having reading problems may find some of the explanations a bit drawn out.
2. Some exercises are quite detailed; for example, The Time Audit on pages 30-36 and Managing Your College Career, pages 40-44. However, these are valid exercises and students need to know such details to effectively solve their problems.
3. The chapter on Understanding Words is rather weak compared to the other chapters in the book. It is probably the weakest chapter of all.
4. The chapter on Exams is adequate but not outstanding, nor is it as thorough as other chapters in the book.
5. No bibliography is provided.

C. General Impression:

Maiorana has written a very usable and respectably book. It is commendable especially for its fine handling of thinking skills, textbook reading, speaking in class, and choosing a curriculum.

Norman, M.H. and Norman, E.S., HOW TO READ AND STUDY FOR SUCCESS IN COLLEGE, 3rd Ed. (SIC), Holt Rinehart & Winston, New York, 1981

A. Strengths:
   1. The text is developed around an "organization" theme which integrates most of the information it has to offer. This device gives the book a rather unique coherence and impact.
   2. The topics covered in the text are representative of those generally included in study skills texts. In this sense, the book seems to be relatively comprehensive.
   3. The sequence in which the topics are discussed seems reasonable and the similarity of organization of individual chapters is useful as a learning aid.
   4. The discussion of "Organizing Your Efforts," which precedes the text, is very useful and gives the student a clear understanding of what is expected.
   5. The division of the book into 14 chapters makes it easily adaptable to the typical college semester.
   6. Consistent with the title of the book, each chapter consists of a skill developing section, a skill application section, and a thousand word reading selection. Careful progress records are kept on these activities.
   7. The best chapters in the book are Chapter 1, Organizing Your College Life, Chapter 2, Organizing Your Time, and Chapter 6, Understanding the Writer. These chapters contain elements and use techniques which

are unique to this particular text.
8. The table of contents provides a clear idea of what is contained in the different chapters.
9. Abundant exercises are provided with each chapter.
10. Removable exercise pages for class assignments makes the book easy to use and correct.

B. Weaknesses:
1. With respect to content, the book is rather prosaic and makes no unique contribution to the field. No single chapter can be cited as particularly outstanding.
2. The book offers a variety of exercises, but they give a rather contrived impression and seem to be directed more toward vocabulary improvement than to the development of specific skills discussed in each chapter.
3. Some of the skills discussed are not particularly important as such; for example, eye movement, emphasis on speed, multiple notetaking methods, semi-reading, no message words, eye muscle exercises. These probably do not merit as much attention as they are given. Research has not established some of these things as significant variables in learning or as generalized skills. Some of these less important topics could be included under other headings rather than be given chapter status.
4. The format gives the book a "packed" appearance. The content, unfortunately, is not as compressed as the print would seem to suggest. The poor reader may be intimidated by

such appearances. The type face is probably too heavy and leading too small, giving the book a monotonous appearance. There is very little margin and the addition of such things as parentheses around the answer spaces doesn't seem to be justified.

5. Illustrations are not used very often or effectively.
6. The book is somewhat deficient in its treatment of writing skills.
7. Learning objectives for individual chapters should be spelled out. Apparently so much time has been given to developing vocabulary that the purpose of the study skills section is almost overlooked.
8. No index is provided.

C. General Impression:
The Norman text is quite typical in its approach and content. It is not particularly outstanding in either style, content, or format. Some of its theoretical orientation is not based on firm research and consequently it drifts off into useless discourse.

It is strong on its organizational emphasis but less commendable on the content that it has organized. The tail seems to wag the dog at times.

The text could be significantly improved by setting specific learning objectives for each chapter. This would give the organization a finer impact and result in more efficient behavior changes.

The book is commendable for its assessment of progress at the end of each chapter, but the assessment is largely one of general comprehension and vocabulary rather than the specific skills which each chapter was designed to develop.

McWhorter, K.T., COLLEGE READING AND STUDY SKILLS (CRS), Little Brown, Boston, 1980

A. Strengths:
   1. This book appears to be effective in achieving the purposes it sets out in the preface. The topics discussed are arranged in an effective sequence and are relatively independent and complete.
   2. The table of contents is very good, it provides an excellent guide to the information contained in the book.
   3. Learning goals and reading purposes are provided with each chapter. Each chapter ends with a good summary and well-conceived exercises.
   4. Chapter 5, Prereading, Chapter 6, Establishing A Purpose For Reading, and Chapter 13, Textbook Underlining are probably the strongest chapters in the book.
   5. The author has provided a good and useable index.
   6. Section 3, Comprehension Skills, is especially noteworthy for its completeness and thoroughness. It is probably the most effective section in the text and the single element which seems to set this text apart from others.
   7. The format and use of illustrations are both very good. The use of wide margins is especially appealing and effective.

8. The exercises provided are quite good and effectively apply the skills taught in the chapter.

B. Weaknesses:

1. On pages 271-273, a poem is included without any particular rhyme or reason. It was apparently done capriciously because no exercises are included and it could be omitted entirely without effecting either the organization or effectiveness of the presentation. It is disappointing that the author failed to use this opportunity to explain specific problems associated with reading and comprehending poetry.
2. The discussions of Comprehension Skills and Careful Reading are not directed toward particular subject matter areas, instead only general notions and procedures are offered which the students are expected to adapt to different areas without any guidance. Some guidance would seem necessary to insure that these general skills can be applied in particular learning situations.
3. McWhorter's discussion of exams is not very comprehensive and is one of the weaker chapters of the text. The chapter does a good job with what it does cover but much emphasis is given to time management to the neglect of test construction theories which might have provided some insight into effective ways of dealing with test taking problems and nothing is done with test anxiety, a very common problem associated with test taking.

4. No discussion of critical reading or thinking skills is offered by McWhorter. This is a major problem in the study skills area and one frequently neglected or poorly handled; two good reasons why McWhorter should have given it at least some attention.
5. No discussion of composition skills is included. Because this is a very common area of difficulty for the college students, such an omission constitutes serious deficiency.
6. The 8½ by 11 size makes the book less convenient to shelf and carry about.
7. The teacher will have difficulty correcting exercises because 'tear out' exercise pages are not provided.
8. No bibliography is provided for chapters.

C. General Impression:
The McWhorter book is a generally good text and does an adequate job on the topics it covers. It is conspicuously deficient in the area of critical reading and composition skills, however. The exercises it offers are effective and well organized, it is clear and specific in its learning objectives, and achieves its stated goals quite well.

Pauk, Walter, HOW TO STUDY IN COLLEGE. (2nd Ed.) (HIS), Houghton Mifflin Co., Boston, 1974

A. Strengths:
1. This book is well organized and addresses most of the topics and skills that students need to master

for efficient learning.
2. The general format of the book is uncluttered and the graphic aids are attractive and effective.
3. Emotional blocks to learning are taken up early in the text and recognized as an important factor in effective learning. This notion is not usually developed in most study skills texts.
4. The treatment of different topics is quite well balanced and specific.
5. Chapter 9, The Classroom Lecture, Chapter 11, Textbooks: Marking and Notetaking, Chapter 14, Writing A Good Paper, and Chapter 18, How to Speak Effectively are among the strongest chapters of the book.
6. The book has a good index.
7. The book is written in a clear, direct style, and includes carefully planned organizational aids which make it easy to preview before reading and review afterwards.
8. Various chapters are clustered under general headings which help the student develop a broader picture and put the contents into perspective.
9. The author is aware of and incorporates valid research findings in the selection of topics included and in the various learning devices he recommends.

B. Weaknesses:
1. Though the information is well organized, the book does not include learning goals, chapter summaries, or application exercises.
2. For the book to be effective, the student will have to apply what is learned. Unfortunately, students

who typically need study skills support are often deficient in the independence and maturity needed to do this. Provision for such transfer is not offered.
3. The discussion of critical topics, such as textbook useage, is quite general or broad. Students need more assistance in applying or adapting what they learn to specific subject matter areas.
4. The book isn't really very much different from a number of other texts in the field; in other words, it has no particular unique advantage over others.
5. No bibliography is provided for the different topics.

C. General Impression:
The Pauk book is well organized and well written. It handles the topics it discusses well. Probably its greatest weakness lies in the fact that it has no application exercises which would insure transfer. It doesn't provide students specific learning goals or summaries for each chapter.

Raygor, Alton L. and Wark, David M., SYSTEMS FOR STUDY (SFS), McGraw Hill, New York, 1980

A. Strengths:
1. The length and format of the book appear well adapted to the type of readers for which it is intended.
2. The information and procedures recommended are based on accepted research.
3. The use of gray boxes to set off summary information is effective.

4. Chapter 6, Preparing for Examinations, Chapter 10, Writing A Term Paper, and Chapter 13, Improving Your Memory, are probably the most noteworthy chapters of the book. Each offers some unique piece of advice or specific procedure not usually found in other texts.
5. In Chapter 1, College Orientation, the authors provide a quick overview of tips which they guarantee will improve study skills as soon as they are read. It's a good motivating device and serves to build a base for what will follow in the text. It also serves to develop a receptive mood or feeling of security that the book will, in fact, be helpful to the student.
6. The sequence of chapters seems to be reasonable and they are complete enough to stand alone.
7. Chapters 14 and 15 on foreign language and science and math study are not found in many study skills texts.

B. Weaknesses:

1. The first chapter gives instant study skill tips. These are valid and useful, but they may also give the impression that there is an easy way to become a proficient student. This may not be true and students might be disappointed to learn that study can be hard work.
2. The text does not provide study aids such as learning goals, summaries, and review questions or exercises.
3. The book does not offer any application exercises at all. Students of the sort needing study skills

are usually not able to transfer what they learn to actual study behavior without some degree of guided practice.

4. The only content areas that receive special attention in developing specialized learning techniques are foreign languages, science, and math. It would be helpful to extend the list to include other areas typical of freshman courses.
5. The book lacks an index and the table of contents is not detailed enough to serve as a useful guide.
6. Reading skills are not dealt with as well as several other skills. This is perhaps the major shortcoming of the book.
7. No bibliography is provided for chapters.

C. General Impression:
Raygor and Wark have developed a sound and practical set of procedures for improving study techniques, but they did not see fit to provide transfer exercises. No learning guides, summaries, or bibliographies are included. The text is not easily used as a reference for lack of an index.

Walter, Tim and Siebert, Al, STUDENT SUCCESS (2nd Ed.) (STS), Holt Rinehart & Winston, New York, 1981

A. Strengths:

1. The contents of STUDENT SUCCESS have been carefully thought out. The book places emphasis on student responsibility and covers the basic areas and problems facing students at college quite well.

2. The text offers a balance between the skill building and motivation-attitudinal aspects of learning improvement. Many books offer one or the other, but few are as well balanced in both respects.
3. The table of contents is comprehensive.
4. The book provides an action-review checklist for different chapters which focus attention on personal needs.
5. Topographically, the book is easy to follow and organization is clearly emphasized by suitable headings. The general format and visual aids used are effective.
6. Information contained in the chapters is presented in a lucid, easy-to-follow style. It is comprehensive and based on sound theoretical principles.
7. Among outstanding chapters in the text are: Chapter 1, Taking Responsibility for Your Learning, Chapter 7, Erroneous Beliefs About Instructors, Etc., and Chapter 12, Experiencing Life As A School. Chapter 10, Characteristics of Successful and Undersuccessful Students is also commendable.

B. Weaknesses:
1. The book would be much more effective if it contained specific learning objectives for each chapter and some other type of activities in addition to the action reviews. Transfer is a critical factor in learning skills. It is reliably assured when students use the new skills taught in some guided procedure as part of the learning task

itself. The authors fail to do this in this text.

2. An index would make the book more useful as a reference. The table of contents, however, is quite detailed and probably serves reference needs adequately.
3. The cartoons included do not really add much to the text. The relationship between them and the different chapters is not obvious and at times appears almost contrived.
4. Bibliographies are not provided at the end of most chapters.
5. Application of learning skills to specific subject areas is not provided. All information in the area of study and reading is general. Students may not be able to adapt the instruction to particular subject matter fields without guided practice. General information on reading and study skills alone is often relatively ineffective for many students.
6. Chapter 8, How To Influence Your Instructor, may be open to question in some respects. A less than enthusiastic or disgruntled student might conceivably use the information to deliberately disrupt the class by using the techniques suggested on how to irritate an instructor. The problem of inefficient teaching is certainly a serious one, but there is reason to believe that the student using these techniques could on exacerbate, not solve the problem.
7. There is no index.

C. General Impression:
The Walter book is one of the better books in the field. It is not as comprehensive as it might be and it lacks application exercises and learning objectives.

Voeks, Virginia, ON BECOMING AN EDUCATED PERSON (4th Ed.) (BEP), W.B. Saunders Co. Philadelphia, 1979

A. Strengths:
1. It is one of the more comprehensive, better written texts on the subject of study skills.
2. It probably is better suited to students who are relatively good readers and already have above average educational aspirations.
3. The book's strongest point is in the area of basic motivation and its thorough discussion of the development of a comprehensive philosophy of education for the individual. This is perhaps the only book on the market that deals with this aspect of study skills in such detail.
4. The book contains many practical suggestions for improving personal learning behavior and attitudes which affect learning.
5. The table of contents is rather detailed and the book has a useful index.
6. The book is printed in an attractive format with good illustrations and effective and useable organizational aids.
7. By clustering information into a few chapters, the author adds coherence to what could become an un-

manageable series of recommendations for improvement.

8. The author stresses personal development of the higher level mental processes such as thinking, perceiving, integrating, and determining. This is quite unique for a study skills book.
9. The book effectively reaches its goals of 1) identifying and clarifying personal goals 2) identifying particular learning handicaps, and 3) developing skills in remedying and coping with common problems associated with getting a college education.
10. The idealism and scholarship which permeate the entire effort provides a model for growing students.
11. It is difficult to select any single chapter or topic as superior because all of them are exemplary.
12. Comprehensive bibliographies follow each chapter.

B. Weaknesses:

1. The book is really better adapted to the more able than the marginal student. Because it aims at excellence, not merely competence, it may not appeal to less motivated students who would most benefit from it.
2. Specific learning objectives are not presented for each chapter. Although this is perhaps not as important for this text because of its unusually effective organization, table of contents, and the level of student for which it seems to be written, it would be most useful for less able students who really need more motivation to

persevere in developing the new habits and attitudes suggested.

3. While the suggestions offered are practical because of their very nature, the book does have a theoretical air about it and may remain mere information unless the student is carefully guided in applying what is learned to real situations.
4. The bibliographies are excellent and comprehensive, but are so extensive that the average student will probably be more intimidated than inspired to use them.
5. Voeks does not include composition skills or vocabulary development in her otherwise complete text.

C. General Impression:

ON BECOMING AN EDUCATED PERSON is a really fine book. The title is well suited to the contents. The book seems directed primarily to the more motivated student and presupposes average academic skills and serious academic aspirations in the students who will read it. Unfortunately, neither of these is particularly characteristic of a number of students found in college today.

The book contains no exercises, as such, and because of the plethora of suggestions and the number of topics covered, weaker students may find it difficult to apply the contents to real situations. The better student, should benefit more because it offers them a means of improving existing skills.

Langan, John, READING AND STUDY SKILLS (2nd Ed.) (RDS), McGraw Hill, Inc., New York, 1982

A. Strengths:
  1. By restricting himself to essential reading and study, the author can focus on basic information, an important consideration in dealing with less skillful students or readers.
  2. Each part of the book begins with a preview and includes abundant activities in an effort to insure student involvement in the learning process.
  3. The problem of attitude is discussed before anything else. This is an especially important strategy for the type of student for which the book seems to be designed. The needs assessment included should be a very effective motivation device.
  4. The table of contents is detailed enough to serve as a reference guide to the contents of the book, but he also includes a good index.
  5. The format, type faces, illustrations, and headings are appropriate and attractive.
  6. The instruction presented is clearly written and activities follow the material immediately rather than being placed at the end of the chapter as customary. This should be an aid in holding students' attention and limits the amount of concentrated reading the student does in a single stretch. This is particularly good pedagogy in dealing with academically weak students.

7. The sequence in which topics are discussed is reasonable enough and easily understood.
8. Mastery tests are provided for the skills taught in the book. A very practical device for insuring transfer.
9. The reading selections in Part 6 should be quite interesting to entering students.
10. A unique feature of the book is the discussion of penmanship and spelling. These topics are not usually contained in study skills books.
11. The author's tendency to break everything into steps is very good so long as the students can follow directions.

B. Weaknesses:
1. Although the book has a rather limited scope it fails to discuss topics it covers in any depth. The emphasis seems to be on the activities rather than on theory. This may be good for some types of students but gives the book an air of superficiality.
2. The discussion of topics presented are too general and lack tie-ins to different types of learning situations. It is dangerous to assume that students who are weak in both reading and study skills will be capable of adapting general instructions to specific situations.
3. Clearly stated learning objectives would be very useful for the level of students for which the text is intended.
4. The proportion of the book devoted to rate improvement exercises limits

the content and detail that is given to other study skills. It seems unwise to spend so much time developing rate in students who have comprehension skill problems.

5. Langan is not particularly strong in his discussion of examination skills. His discussion of test anxiety is superficial and almost ineffective. This is particularly unfortunate because of the type of student he addresses.
6. The text seems to have a very low estimation of the abilities of the reader. This may appropriate in some instances but it does make the book less attractive to better students. It is possible that even the poorer student might feel somewhat offended by such low expectations.

C. General Impression:
Langan has written a rather elementary book on study skills. Its major strength lies in having many exercises and a minimum of theory. It is restricted in its scope and its thoroughness in discussing the topics it contains.

The book is probably most useful to the poorer student who needs some type of success experience to build a foundation upon which to build the more mature, complex study skills needed for most successful college programs. The author has tried to make the text versitile by dealing with distinct areas; practical by including a wide variety of activities and by relating material from a variety college texts. Within these limits,

Fisher

Content Analysis of Major Manuals in Study Skills

Topic Discussed	SSG	SSA	SSS	HTL	SIC	CRS	HTS	SFS	STS	BEP	RDS
I. PREPARING TO LEARN											
A. Types of Learning	---	A	---	---	A	---	---	---	---	---	---
1. High school to college	---	---	---	---	---	---	---	A1	---	---	---
2. Returning student	---	A2	---	---	A2	---	---	A2	---	---	---
3. Graduate student	---	A3	---	---	---	---	---	---	---	---	---
B. The College Environment	---	B	---	B	---	B	---	---	B	---	---
1. Learning the ropes	---	---	---	---	---	B1	---	---	B1	---	---
2. Using advisers	---	---	---	---	---	---	---	---	---	---	---
3. Sources of help	---	B3	---	B3	---	B3	---	---	B3	---	---
C. Elements of Success	---	C	---	C	C	---	C	---	C	C	C
1. Basic requirements(Attitude)	---	C1	---	---	---	---	---	---	---	---	---
2. Goal clarification	---	---	---	---	---	---	C2	---	C2	C2	C2
3. Self-management	---	---	---	C3	C3	---	---	---	C3	C3	C3
4. Decisions needed	---	---	---	C4	---	---	---	---	---	---	---
D. The Learning Set	---	D	---	D	D	D	---	---	D	D	D
1. Study environment	---	---	---	---	---	---	---	---	D1	D1	---
2. Time management	---	D2	---	D2	D2	D2	D2	D2	D2	D2	D2
3. Planning the study hour	---	---	---	---	---	---	---	---	---	D3	---
II. TECHNIQUES OF LEARNING											
A. Textbook Learning	A	A	---	A	A	A	A	A	A	A	A
1. Text as a tool	---	---	---	A1	---	A1	A1	---	---	---	---
2. Reading for meaning	A2	A2	---	A2	A2	A2	---	A2	A2	A2	A2
3. Special tactics in	A3	---	---	---	---	---	---	---	---	---	---
a. literature, drama	---	---	---	---	---	---	---	---	---	---	---
b. social sciences	---	---	---	---	---	---	---	---	---	---	---
c. natural sciences	---	---	---	A3c	---	---	A3c	A3c	---	---	---
d. foreign languages	---	---	---	---	---	---	A3d	A3d	---	A3d	---
e. laboratory manuals	---	---	---	---	---	---	---	---	---	---	---
f. business subjects	---	---	---	---	---	---	---	---	---	---	---
g. computer science	---	---	---	---	---	---	---	---	---	---	---
h. law	---	---	---	---	---	---	---	---	---	---	---
i. math	---	---	---	---	---	---	A3i	A3i	---	---	---
j. workbooks & prog. materials	---	---	---	---	---	---	---	---	---	---	---
4. Reading rate	---	A4	---	A4	A4	A4	A4	A4	---	---	A4

Topic Discussed	SSG	SSA	SSS	HTL	SIC	CRS	HTS	SFS	STS	BEP	RDS
5. Underlining & Notemaking	---	---	---	---	---	A	A	A	---	---	A
a. how to underline	---	---	---	---	---	A5a	A5a	A5a	---	---	---
b. what to underline	---	---	---	---	---	---	A5b	---	---	---	---
c. marginal notes, text notes	---	---	---	---	---	---	A5c	---	---	---	---
d. using text notes	---	---	---	---	A5d	A5d	---	---	---	---	A5d
B. Classroom Learning	B	B	B	B	B	B	B	B	B	B	B
1. Preparing for participation	---	---	---	---	---	---	---	---	---	B1	---
2. Forms of participation	---	---	---	B2	---	B2	---	---	B2	---	---
3. Lectures--a teaching device	---	---	---	---	---	---	---	---	---	---	---
4. Listening for meaning	B4	B4	---	B4	---	---	B4	B4	---	B4	B4
5. Notemaking techniques	B5	B5	---	B5	---	---	B5	B5	---	---	B5
6. Problem situations	---	---	---	---	---	---	---	---	---	---	---
a. lecturer-poor teaching	---	---	---	---	---	---	---	---	---	---	---
b. seminars & discussion	---	B6b	---	---	B6b	---	---	---	---	---	---
c. lab notes	---	B6c	---	---	---	---	---	B6c	---	---	---
d. practicum/field trips	---	B6d	---	---	---	---	---	---	---	B6d	---
e. research paper notes	---	---	---	---	---	---	---	---	---	---	---
f. tutorial & computer learning	---	---	---	---	---	---	---	---	---	B6f	---
g. TV classes	---	---	---	---	---	---	---	---	---	B6g	---
h. learning labs	---	---	---	---	---	---	---	---	---	---	---
i. independent study	---	B6i	---	---	---	---	---	---	---	---	---
7. Using lecture notes	---	---	---	---	---	---	---	---	---	---	---
8. Activities & sports	---	---	B8	---	---	---	---	---	---	---	---
C. Concentration & Memory	C	C	C	C	C	---	C	C	C	C	C
1. Role of habit & set	---	---	C1	---	---	---	---	---	---	C1	---
2. Developing concentration	---	---	C2	C2	---	C2	---	C2	---	C2	---
3. Creating interest	C3	---	---	C3	---	---	---	---	---	---	---
4. Comprehension & memory	---	---	C4	C4	C4	C4	---	---	---	---	---
5. Methods for remembering	---	C5	C5	C5	---	C5	C5	C5	---	---	C5
a. principles of association	---	---	---	---	---	---	---	---	---	---	---
b. organizational patterns	---	---	---	---	---	---	---	---	---	---	---
6. Review methods	---	---	---	---	---	---	---	---	C6	---	---
D. Improving Thinking Skills	---	D	---	D	D	---	---	D	D	---	---
1. Learning style	---	---	---	D1	---	---	---	---	D1	---	---
2. Analysis & criticism	---	D2	---	---	D2	---	---	---	---	---	---
3. Visualization	---	---	D3	---	---	---	---	---	D3	---	---
4. Problem solving	---	D4	D4	---	---	---	---	D4	D4	---	---
5. Guide questions	---	---	---	---	---	---	---	---	---	---	---

Topic Discussed	SSG	SSA	SSS	HTL	SIC	CRS	HTS	SFS	STS	BEP	RCS
III. TEST TAKING TECHNIQUES											
A. Preparation for Tests	A	A	---	A	A	A	A	A	A	A	A
1. What to know--test anxiety	---	A1	---	A1	A1	---	---	---	A1	A1	A1
2. Review techniques	A2	---	---	---	---	A2	A2	A2	---	A2	---
3. Predicting items	---	---	---	---	---	---	---	---	---	A3	---
B. Principles of Test Construction	---	---	---	---	---	---	---	B	---	---	---
1. Design	---	---	---	---	---	---	---	B1	---	---	---
2. Types	---	---	---	---	---	---	---	---	---	---	---
3. Content validity	---	---	---	---	---	---	---	---	---	---	---
4. Discrimination	---	---	---	---	---	---	---	---	---	---	---
C. Test Taking Strategies	C	C	---	C	C	---	C	C	---	---	C
1. Objective tests	---	---	---	C1	C1	---	C1	---	---	---	C1
a. Types	---	C1a	---	---	---	---	---	C1a	---	---	---
b. Formats	---	C1b	---	---	---	---	---	C1b	C1b	---	---
c. Procedures	C1c	---	---	---	---	---	---	C1c	---	---	---
2. Essay tests	---	---	---	---	C2	---	C2	C2	C2	---	C2
a. Design	---	---	---	---	---	---	---	---	---	---	---
b. Identifying requirements	C2b	---	---	---	---	---	---	C2b	---	---	---
c. Organizing response	C2c	---	---	---	---	---	---	C2c	---	---	---
d. Procedures	---	---	---	---	---	---	---	C2d	---	---	C2d
3. Take home tests	---	---	---	---	---	---	---	---	---	---	---
4. Lab tests	---	---	---	---	---	---	C4	---	---	---	---
5. Oral exams	---	C5	---	---	---	---	---	---	---	---	---
D. Learning from Exams	---	---	---	D	---	---	---	---	---	---	---
IV. COMPOSITION SKILLS											
A. Topic Selection	A	A	---	---	---	---	A	A	---	---	---
1. Deadline	---	---	---	---	---	---	A1	---	---	---	---
2. Reduce topic	A2	---	---	---	---	---	A2	A2	---	---	---
3. Develop perspective	---	A3	---	---	---	---	A3	---	---	---	---
4. Thesis	---	---	---	---	---	---	A4	---	---	---	---
B. Researching the Paper	B	B	---	B	B	---	B	B	D	---	B
1. Locating sources (library)	---	B1	---	B1	B1	---	B1	B1	B1	---	B1
2. Surveying references	---	---	---	---	---	---	---	---	---	---	---
3. Notes	---	---	---	---	---	---	B3	B3	---	---	---

Topic Discussed	SSG	SSA	SSS	HTL	SIC	CRS	HTS	SFS	STS	BEP	RDS
C. First Draft	C	C	---	C	---	---	C	C	---	---	---
1. Organization pattern	---	C1	---	---	---	---	C1	---	---	---	---
2. Footnotes & references	---	C2	---	---	---	---	C2	---	---	---	---
3. Graphics & format	---	---	---	---	---	---	---	C3	---	---	---
D. Editing	D	D	---	---	---	---	D	---	---	---	---
1. Grammar	---	D1	---	---	---	---	D1	---	---	---	---
2. Structure	---	D2	---	---	---	---	D2	---	---	---	---
3. Style	---	D3	---	---	---	---	D3	---	---	---	---
E. Heuristics for Disciplines	---	---	---	---	---	---	---	---	---	---	---
1. Literature	---	---	---	---	---	---	---	---	---	---	---
2. Business/commercial	---	---	---	---	---	---	---	---	---	---	---
3. Social/natural sciences	---	---	---	---	---	---	---	---	---	---	---
4. Humanities	---	---	---	---	---	---	---	---	---	---	---
F. Using the Computer	---	---	---	---	---	---	---	---	---	---	---
V. VOCABULARY DEVELOPMENT											
A. Importance	---	---	---	---	A	---	A	---	---	---	---
B. Types	B	B	---	---	---	---	B	---	---	---	---
C. Acquisition of Vocabulary	---	C	---	C	C	C	C	C	---	---	C
D. Review & Use of Vocabulary	---	---	---	---	---	---	---	---	---	---	---
E. Spelling	---	---	---	---	---	---	---	---	---	---	E

the book generally succeeds.

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THE PALAB'S PAINLESS SPELLING PROGRAM

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ABSTRACT

This article describes a college reading lab spelling program based on the book, Spelling 1500 by Hook (Harcourt Brace Jovanovich). The program uses an 8K computer to assist in testing students, diagnosing and categorizing spelling weaknesses, assigning appropriate remedial work, evaluating student progress, and analyzing which remedial assignments have proven successful and which have not. The program is of interest because of its practical application, its simple nature, and because it augments, rather than infringes on, copyrighted material.

I'd like to mention at the start that this program is one more chapter in the continuing saga of Wanda Wang. For those of you who are not familiar with Wanda, I should explain that Wanda is a small computer which our Muskegon Community College Personalized Achievement Lab acquired about six years ago on a matched-money grant from the federal government. Wanda is a Wang 2200 with two disk drives and 8K of memory. She is married to a Texas Omni 800 printer. When we got Wanda, like many proud parents, we thought she was a budding genius, but looking at the line of computers on the market today, we realize she is probably slightly retarded. An 8K computer, for those of you not familiar with computer intelligence, is just about smart enough to counts its fingers but has difficulty when you throw in the toes. You can carry smarter computers around in your briefcase and maybe in your pocket.

When we left Wanda, a year ago, she was busy figuring out readability levels of textbooks, and writing out individual reading prescriptions for each of our PALab students based on the results of Nelson-Denny tests.

Since then Wanda has learned to spell, and to write individual spelling prescriptions for students. She also helps us keep track of what parts of our program are working, and which ones don't seem to be.

Let me explain:

An ideal spelling program should:

1. Use a diagnostic test to analyze and evaluate a student's spelling weaknesses.
2. Automatically write a program specifically designed to remedy the weaknesses uncovered.
3. Have regular sub-tests to check progress as the student moves from skill to skill.
4. Include several forms of every subtest to permit re-testing of a skill without repeating the same words.
5. Incorporate a final exam and an interpretive print-out that automatically showed:
    - A. Which errors were made in the pre-test;
    - B. What skills were worked on;
    - C. Which errors were made in the post-test; and
    - D. Which sections of the program had proven successful, and which had failed.

6. Utilize published, tested materials, and not even hint at copyright infringement. And finally,
7. Require only the slightest effort and time on the part of a busy staff.

Our program does all that.

1. Use a diagnostic test to analyze and evaluate a student's spelling weaknesses.
   A. We base our program on Hook's Spelling 1500 Second Edition. It has a diagnostic test at the beginning which gives 85 words testing 85 possible weaknesses:
      1. Word No. 1 - quality - checks the "qu" combination.
      2. Word No. 3 - monkeys - deals with "ey" words.
      3. Words No. 14-20 deal with words easily mispronounced (candidate, athletics).
      4. Six different words deal with doubling or not doubling letters.
   B. Our pretest is now on a cassette. A student checks out a player and the taped test and either writes the words on paper, or, if the student can type and if the Wang is free, types the words into the computer. After the student completes the typing, Wanda checks the spelling and prints a double-list - "Your Spelling" and "Correct Spelling." She then goes on to stage 2 - Writing a prescription. Handwritten tests must be hand-scored by our staff and the numbers of incorrect answers fed into the computer.

C. Although Professor Hook does not care to group similar types of errors together, our experience with students indicates that it does pay to teach "ise" with "ize" and "yze"; or all the "ous" words at once; or all the double letters at once.

Therefore, we have programmed Wanda to group certain incorrect answers together. We have unit-groups for each of the following:

The schwa sound
ible/able
ous
ise - yze - ize
ar/or
-al/-le/-el
dropping the final e
double letters

D. Each word on Hook's Diagnostic test corresponds to a unit of explanation and drill in the book. Word number one relates to unit number one, etc.

2. Automatically write a program specifically designed to remedy the weaknesses uncovered.

A. Our computer prints out a program listing the units which need to be worked on in appropriate groups. Each unit teaches anywhere from one dozen to three dozen similarly constructed words.

3. Have regular sub-tests to check progress as the student moves from skill to skill.

When a student has completed four to six units - often all under one error heading - we give a unit-group test consisting of five words randomly selected from the one dozen to three dozen words that have been taught. In earlier days this meant a staff member had to sit down with the student, pick out five words, read them; find the next unit, choose five more, read them; and so on until the units had all been covered. Now, however, we have all the units on cassettes.

4. Include several forms of every subtest to permit re-testing of a skill without repeating the same words.

   Each cassette has two groups of five words, and the student merely asks for the cassettes by number, sits down at one of our testing carrells, plugs the cassette into the permanent player there, and takes the test. Our staff checks the answers and gives the graded test to the instructor.

5. Incorporate a final exam and an interpretive print-out that automatically showed:
   - A. Which errors were made in the pre-test;
   - B. What skills were worked on;
   - C. Which errors were made in the post-test; and
   - D. Which sections of the program had proved successful, and which had failed.

Hook has a final exam which exactly correlates with the pre-test and, by extension, with the numbered units. Our computer is not programmed to take and grade the final test, but it could be.

Wanda is programmed to list all the errors made on the pre-test, and all those missed on the post-test; to note if a unit has been worked on (most students miss so many words on the pre-test that they can only work on about half the areas of weaknesses in one semester), and to tell whether that unit has been successful: i.e. the student spelled the word incorrectly on the pre-test and correctly on the post.

PROBLEMS AND ACCOMMODATIONS

1. On the Diagnostic Test some students misspell a word, but not the way they are supposed to. A unit on double-letters does little good if the test word "occurred" has been spelled "accurred". We have addressed this problem and have chosen to handle each case in the most expeditious way possible: we pretend it didn't happen.
2. The post-test appears in the book itself, opening the way to a cram-study of this test instead of attending to the learning involved in the units. We solve this problem by encouraging students to use our lab copies of the workbook (from which the final exam has been untimely rip'd) rather than purchasing the book.
3. On the post-test we often have serendipitous improvement. A student will improve in units he or she has not studied. We also have students who spell a construction correctly on the pre-test and then get its post-test twin wrong. We treat these mirrored happenstances equally. Modern Physics teaches us that the universe is impossible to understand, and we in the PALab go along with that.